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SPECIES OF FRESHWATER GASTROPODS DESCRIBED BY YA.I. STAROBOGATOV: PULMONATA (ACROLOXIDAE), HETEROBRANCHIA (VALVATIDAE) AND CAENOGASTROPODA (VIVIPAROIDEA, TRUNCATELLOIDEA AND CERITHIOIDEA)

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ABSTRACT

Professor Yaroslav Igorevich Starobogatov was a famous Russian biologist, zoologist and malacologist of wide knowledge in different fields of invertebrate zoology. Ya.I. Starobogatov travelled all over the former Soviet Union and collected numerous samples of mollusks and other invertebrates. As a result, he studied and described many new species, genera and families of different invertebrates, including mollusks. More than one thousand names of Mollusca were introduced by Ya.I. Starobogatov. This paper is a continuation of publishing the photographs of extant type specimens or topotypes of freshwater gastropods described by Ya.I. Starobogatov (1932–2004) with his disciples and coauthors. Photographs are given for 83 of 84 considered species belonging to Acroloxidae (Pulmonata), Valvatidae (Heterobranchia), and Viviparidae, Amnicolidae, Baicaliidae, Bithyniidae, Hydrobiidae, Lithoglyphidae, Melanopsidae and Thiaridae (Caenogastropoda). The data presentation includes detailed information about types; the "Additional records" section lists only the Zoological Institute (ZIN) catalog-based data because ZIN is the place of storage of the type specimens and the whole material studied by Ya.I. Starobogatov. Published data on subsequent records of the species are cited in the section "History of the name application". The references are provided with brief information about their content. The synonymy, if exists, includes the references to authors of synonymization. The ecology information is based on publications and label data.

Key words: freshwater gastropods, records, references, Starobogatov, shell photos, types

ВИДЫ ПРЕСНОВОДНЫХ БРЮХОНОГИХ МОЛЛЮСКОВ, ОПИСАННЫЕ Я.И. СТАРОБОГАТОВЫМ: PULMONATA (ACROLOXIDAE), HETEROBRANCHIA (VALVATIDAE) И CAENOGASTROPODA (VIVIPAROIDEA, TRUNCATELLOIDEA AND CERITHIOIDEA)

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РЕЗЮМЕ

Профессор Ярослав Игоревич Старобогатов – выдающийся российский биолог, зоолог и малаколог с широким кругозором в различных областях зоологии беспозвоночных. Я.И. Старобогатов путешествовал по

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всему Советскому Союзу и собирал многочисленные образцы моллюсков и других беспозвоночных, в результате исследований он описал много новых видов, родов и семейств различных беспозвоночных, включая моллюсков. Известно свыше тысячи названий моллюсков, учрежденных Я.И. Старобогатовым. Настоящая статья является продолжением публикации фотографий типовых экземпляров видов пресноводных брюхоногих моллюсков, введенных Я.И. Старобогатовым (1932–2004) с учениками и соавторами. Фотографии приведены для 83 из 84 обсуждаемых видов, относимых к семействам Acroloxidae (Pulmonata), Valvatidae (Heterobranchia), Viviparidae, Amnicolidae, Baicaliidae, Bithyniidae, Hydrobiidae, Lithoglyphidae, Melanopsidae and Thiaridae (Caenogastropoda). Представлена подробная информация о типовых экземплярах, в разделе «Дополнительные находки» перечислены все находки вида, основанные на коллекции Зоологического института РАН (ЗИН), поскольку в коллекции ЗИН хранятся не только типы, но также весь материал, изученный Я.И. Старобогатовым. Опубликованные данные, дополняющие находки видов и сведения о них, приведены в разделе «История упоминания вида». Ссылки снабжены краткой информацией о содержании публикаций. Синонимия, если она имеется, включена в список публикаций. Информация об экологии основана на опубликованных данных и этикеточных записях.

Ключевые слова: пресноводные брюхоногие моллюски, записи, ссылки, Старобогатов, фотографии раковин, типы

INTRODUCTION

Professor Yaroslav Igorevich Starobogatov was a famous Russian biologist, zoogeographer, zoologist and malacologist, with wide knowledge and many new ideas in various fields of invertebrate zoology. Starobogatov travelled all over the former Soviet Union and collected numerous samples of mollusks and other invertebrates in the Ukraine (including the area of the Chernobyl nuclear power plant accident), Baltic States, the Caucasus, Far North, Siberia (including Lake Baikal), Far East, and many other places. As a result, he studied and described many new species, genera and families of different invertebrates, icluding mollusks. At least, one thousand sixteen names of Mollusca were introduced by Ya.I. Starobogatov (Sysoev and Kantor 1999; the figure was subsequently increased due to personal communications). In general, he was probably the most prolific taxonomist, as concerns the number of new taxa, in the whole two-century long history of Russian malacology. He trained many disciples from different republics of the former USSR; most of them still keep communication and conduct joint researches. This publication is dedicated to the 85th anniversary of Professor Starobogatov.

Shelled Mollusca are mostly among very few groups of invertebrates, which are still basically identified by the outward appearance of external skeleton (the shell in this case). Therefore, the adequate (preferably photographic) representation of the shell in the type specimens remains a very important task in studies of type collections.

The previous publications (Sitnikova et al. 2014a–c) were devoted to types of 101 species (families Lymnaeidae, Planorbidae and Physidae (Pulmonata)) described by Ya.I. Starobogatov with his disciples and coauthors. Current publication is a continuation and includes: 14 spp. – genus *Acroloxus* Beck, 1838 (Pulmonata: Acroloxidae), 16 – Valvatidae (Heterobranchia), 3 – Viviparidae, 4 – Amnicolidae and Baicaliidae, 8 – Bithyniidae, 21 – Hydrobiidae, 2 – Lithoglyphidae, 14 – Melanopsidae, and 2 – Thiaridae (Caenogastropoda). The basic scheme of the data presentation is the same as used previously (Sitnikova et al. 2012, 2014a–c).

The two main reasons of these publications are to show the actual state of types of the species because originally the shells were illustrated by line drawings in all described species, making species identification difficult, and to show the shell similarity of closely related species. In spite of some species were synonymized (see review in Vinarski and Kantor 2016), we consider all the species described by Starobogatov, because some of them may be regarded as morphotypes or subspecies, or initial species recently divergent. Most species have been poorly studied or not studied at all since their description. There are still very few data on ecology, intra- and infrapopulation variability of morphological characters, not to mention the basically lacking molecular information about the species.

SYSTEMATICS

PULMONATA Cuvier, 1814

ACROLOXIDAE Thiele, 1931

Presently the species of the family Acroloxidae in the freshwater fauna of Russia and adjacent countries are grouped into five genera: *Acroloxus* Beck, 1837, *Pseudancylastrum* Lindholm, 1909, *Baicalancylus* Starobogatov, 1967, *Gerstfeldtiancylus* Starobogatov, 1989, and *Frolikhiancylus* Sitnikova et Starobogatov, 1993. The four latter genera are endemics of Lake Baikal. They include 17 species described by Starobogatov, which, along with other Baikalian limpets, are considered in a separate paper (Shirokaya et al. 2017). Here we provide data on 14 species of the genus *Acroloxus* described by Starobogatov together with coauthors: 10 species were described in coauthorship with N.D. Kruglov, 2 – with I.M. Moskvicheva and N.D. Kruglov, and 2 – with L.A. Prozorova. The genus *Acroloxus* was subdivided by Starobogatov and Kruglov (1991) into 2 subgenera: European-Siberian *Acroloxus* and South-Far-Eastern *Amuracroloxus* Kruglov et Starobogatov, 1991, whereas the "Guide to identification of freshwater gastropods of Russia and adjacent territories" (Starobogatov et al. 2004) lists acroloxid species without subgeneric division. That was due to the high level of conchological similarity of the two subgenera, which basically differ by the mantle pigmentation and the copulative apparatus characters. We also list species without their subgeneric position, though there are already molecular-phylogenetic evidences (Albrecht et al. 2007; Stelbrink et al. 2015) for existence of at least two lineages in the genus *Acroloxus* of the Russian fauna: European species and Siberian-Far-Eastern. Indications of subgeneric position of the species are given in the "History of the name application" section.

1. *Acroloxus caucasicus* Kruglov et Starobogatov, 1991

(Fig. 1A–F)

History of the name application.

Kruglov and Starobogatov 1991: 73–74. fig. 2, *7* (description as *A.* (*Acroloxus*), key to identification, possibly North-Black-Sea and South-European species));

Starobogatov et al. 2004 (key to identification, general distribution: Daghestan, Stavropol Territory of Russia);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Shaitan-Kazak Lake, Chontaulsk Reserve, Daghestan (Caucasus).

Types. Holotype (dry): No. 1; paratype (dry) from type locality (coll. Saidov, 1954): No. 2 and 1 (dry, broken) paratype from Stavropol (coll. W. Faussek, no additional data): No. 3.

Additional records. No data.

Ecology. No data.

2. *Acroloxus shadini* Kruglov et Starobogatov, 1991

(Fig. 1G–J)

History of the name application.

Kruglov and Starobogatov 1991: 73, fig. 2 *6* (description as *A.* (*Acroloxus*); key to identification, distribution: from shore line of Atlantic Ocean to Ural Mountains and then along Northern Kazakhstan to Altai));

Starobogatov et al. 2004 (key to identification, general distribution: entire Europe, south of western Siberia, north of Kazakhstan, Altai, in rivers and lakes);

Stadnichenko 2004 (record from Teterev River near Chudnov Settlement, Zhitomir Province, Ukraine; shell variability);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Dolgin 2009 (mentioned for Irtysh and Middle Ob zoogeographical provinces in Siberia);

Andreeva et al. 2010 (2011) (record from Ton River near Kuibyshev city, Novosibirsk Province);

Shirokaya et al. 2012 (comparison with *A. egirdirensis* from Turkey);

Khokhutkin and Vinarski 2013 (as a synonym of *Acroloxus lacustris* (Linnaeus, 1758); comparison with *A. lacustris* and *A. oblongus* on measuremets);

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Shaitan-Kazak Lake, Chontaulsk Reserve (=Yangiyurtovski Reserve), Daghestan (Caucasus).

Types. Holotype (dry): No. 1; paratypes: 5 shells from type locality (coll. Saidov, 1954); No. 2; 1 shell – Dmitrov, Moscow Province (coll. W. Lindholm, 1913): No. 3; 4 shells – Biebrich, Rhein River (coll. W. Lindholm, 1903): No. 4; 1 shell – Dnieper River (coll. Brauner): No. 5; 2 shells – Myshega River (Alexinsky District of Kaluga Province) (coll. Tzvetkov and Tzvetkova, 1931): No. 6 (ZIN).

Additional records. Three specimens (spms) in alcohol – lake near Predgornoye village, East Kazakhstan (coll. L. Krivosheina, 1970): No 7 (ZIN); Dnieper drainage (Stadnichenko 2004) and waterbodies of Middle and South Urals and southern West Siberian Plain (Andreeva et al. 2010 (2011).

Ecology. Found on water vegetation in shallow-water zone.

Remarks. In the type locality the species was found together with conchologically similar *A. caucasicus*; anatomy of both species has not been studied. Snails of both species were initially identified as *A. lacustris* (Linnaeus, 1758) by Saidov; snails under the same name had been housed in the ZIN collection before reidentification by N. Kruglov and Ya. Starobogatov.

3. *Acroloxus rossicus* Kruglov et Starobogatov, 1991
(Fig. 1K–M)

History of the name application.

Kruglov and Starobogatov 1991: 72–73, fig. 2 *5*, 3 *4* (description as *A.* (*Acroloxus*), key to identification, morphology of the copulatory organ; distribution – localities of the types).

Starobogatov et al. 2004 (key to identification, general distribution)

Stadnichenko 2004 (records from Guiva River drainage, Zhitomir Region, Ukraine; shell variability)

Silina and Proksin 2008 (records from bogs of Belgorod and Lipetsk provinces,)

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution)

Filippenko 2011 (records from reed and reed mace with average occurrence 0.2% in littoral of the Curonian Lagoon, Kaliningrad Province, Baltic Sea)

Filippenko 2012 (records from waterbodies of Kaliningrad Province)

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics', IUCN conservation status).

Type locality. Myshega River, surroundings of Aleksin, Kaluga Province (central Russia).

Types. Holotype (dry): No. 1; paratype: 8 shells from type locality (coll. Tzvetkov and Tzvetkova, 1931): No. 2; 1 shell – Shaitan-Kazak Lake (Daghestan): No. 3; 1 shell – Kem River (Karelia): No. 4; 3 in alcohol and 2 shells from Onega Lake at Petrozavodsk: No. 5.

Additional records. Absent in ZIN collection. Dnieper River drainage (Stadnichenko 2004), vicinities of Kaliningrad city (Filippenko 2011).

Ecology. In the Dnieper River drainage, the species was found in a small boggy pond with weak vegetation and silty bottom, at depth to 0.5 m; the population density was 20 spms/m^2 (Stadnichenko 2004). In vicinities of Kaliningrad, the species representatives were collected on sandy-stony and sandy bottom with water vegetation (Filippenko 2011, 2012).

Remarks. The types were collected together with types of *A. shadini* in the Myshega River, and together with types of *A. caucasicus* and *A. shadini* in Shaitan-Kazak Lake, Chontaulsk Reserve, Daghestan; all these snails were initially identified as *A. lacustris* by different investigators.

4. *Acroloxus lindholmi* Kruglov et Starobogatov, 1991
(Fig. 1N–P)

History of the name application.

Kruglov and Starobogatov 1991: 72, fig. 2 (4) (description as *A.* (*Acroloxus*)), key to identification);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Luga River near settlement Preobrazhenskoe, Leningrad Province.

Types. Holotype (dry): No. 1 and 1 dry paratype from type locality (coll. W. Lindholm, 1917) No. 2.

Additional records. No data.

Ecology. No data.

Remarks. Initially, the species was identified by W. Lindholm as *A. lacustris*. The anatomy remains unstudied.

5. *Acroloxus okaensis* Kruglov et Starobogatov, 1991
(Fig. 1Q–S)

History of the name application.

Kruglov and Starobogatov, 1991: 70–72, fig. 1 *3*, 3 *3* (description as *A.* (*Acroloxus*), morphology of copulatory apparatus and stated differences from *A. oblongus* and *A. lacustris*; key to identification, distribution: Europe (except, probably, its north-east));

Stadnichenko 2004 (record from a pond at Dvorishche village, Zhitomir Province, Ukraine; shell variability);

Starobogatov et al. 2004 (key to identification, general distribution: Europe, except, probably, north-east);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

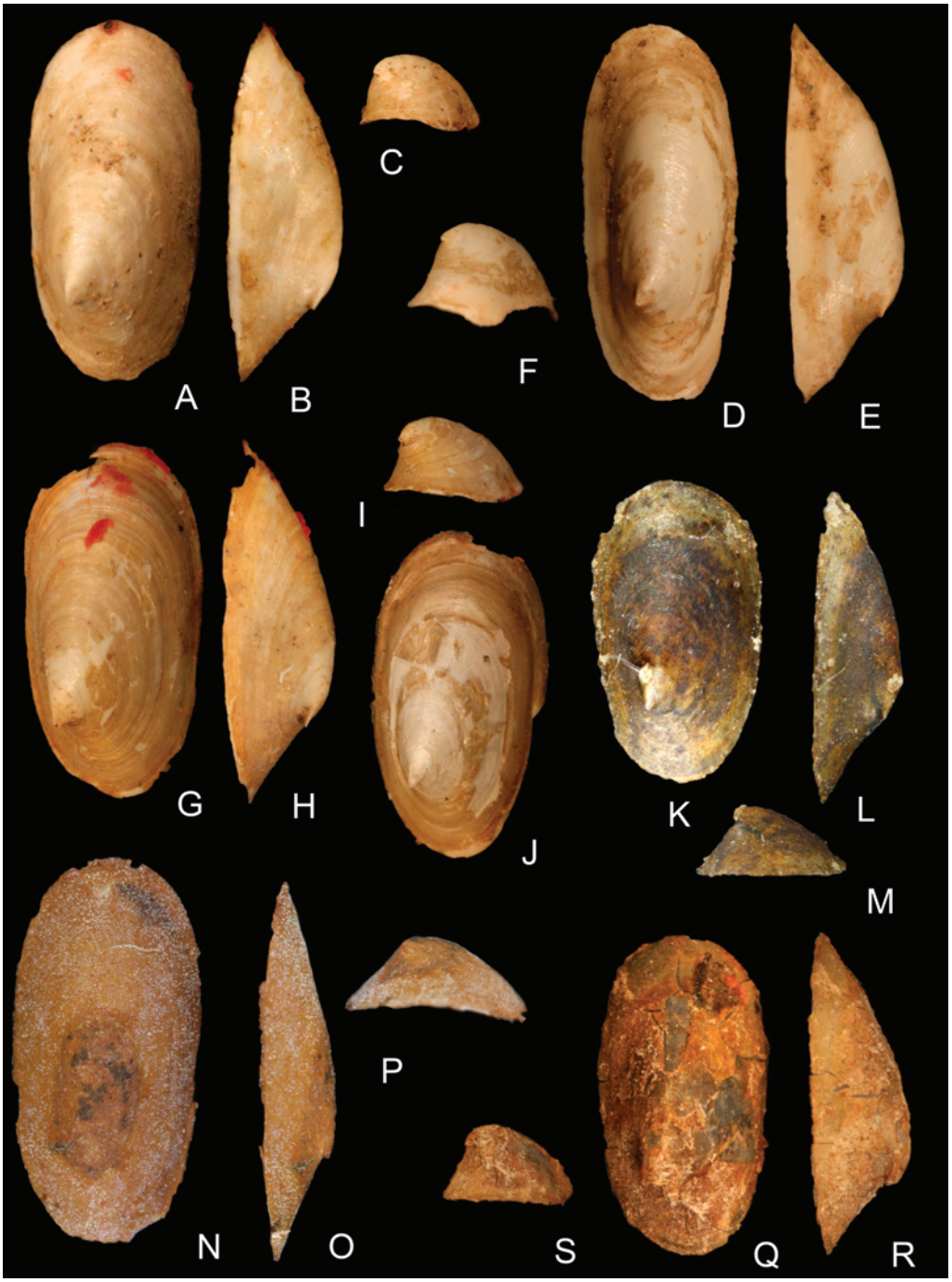

Fig. 1. A–C – *Acroloxus caucasicus*, holotype, L = 4.4 mm; D–F – *Acroloxus caucasicus*, paratype No. 2, L = 5.2 mm; G–I – *Acroloxus shadini*, holotype, L = 6.1 mm; J – *Acroloxus shadini*, paratype No. 2, L = 5.0 mm; K–M – *Acroloxus rossicus*, holotype, L = 4.3 mm; N–P – *Acroloxus lindholmi*, holotype, L = 5.9 mm; Q–S – *Acroloxus okaensis*, holotype, L = 4.8 mm.

Kotsur 2010 (record from Bielorussian Lakeland);

Filippenko 2012 (records in waterbodies of Kaliningrad Province);

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Oka River (central Russia), backwater Studenetz (neighborhood of the Murom city).

Types. Holotype (dry): No. 1 and 38 paratypes: 2 shells from type locality (coll. V. Shadin, 1921); 1 shell – backwater (of Oka River) at former Veletminsky factory, Nizhniy Novgorod Province (coll. V. Shadin, 1921): No. 3; 1 spm in alcolohol – Ukshezero Lake, Karelia (coll. V. Makarov, 1931): No. 4; 9 spms in alcohol (No. 5) and 25 shells (No. 6) – pond in Novobelichi District, Kiev city (coll. Starobogatov, 1989 and 1990).

Additional records. In 1991, Starobogatov collected 50 spms in a pond of Novobelichi District, Kiev city, without additional information about the environment (ZIN collection); Dnieper River drainage (Stadnichenko 2004); waterbodies of Kaliningrad (Filippenko 2011), and Byelorussian Lakeland (Kotsur 2010).

Ecology. Collected on higher water vegetation at the depth down to 50 cm (Stadnichenko 2004). In vicinities of Kaliningrad, the limpets were collected on sandy-stony and sandy bottom with water vegetation (Filippenko 2012).

6. *Acroloxus arachleicus* Kruglov et Starobogatov, 1991

(Fig. 2A–E)

History of the name application.

Kruglov and Starobogatov, 1991: 74, fig. 2, *9* (description as *A.* (*Acroloxus*), shell measurements of 6 paratypes from type locality, possible endemic of Angara zoogeographical province, key to identification);

Klishko 2001; 2003 (record from Arakhley lake);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev, 2005; Kantor et al., 2010 (information about types, type locality and general distribution);

Dolgin 2009 (record for Lower Yenissei zoogeographical province, Siberia);

Prozorova et al. 2009 (mentioned for Arakhley lake and Selenga River basin);

Matafonov 2013 (shell photo, reference)

Shirokaya et al. 2011 (record from Shirokaya River, Arakhley lake basin);

Stelbrink et al. 2015 (position on molecular-phylogenetic tree);

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Arakhley Lake, Zabaikalye (SE Siberia).

Types. Holotype (in alcohol): No. 1; paratypes: 8 in alcohol and 7 dry from type locality (coll. I. Shapovalova, 1978): No. 2.

Additional records. Kicherskoe Lake along the stream of the Kichera River (North Baikal) (coll. R. Kamaltynov, 1974; det. Ya. Starobogatov) (ZIN). Selenga River basin (Prozorova et al. 2009), Shirokaya River, Arakhley Lake basin (Shirokaya et al. 2011).

Ecology. The limpets were collected from leaves of water vegetation, at 2–3 m depth, on sandy and silty bottom (label data).

7. *Acroloxus orientalis* Kruglov et Starobogatov, 1991

(Fig. 2F–H)

History of the name application.

Bogatov and Zatrawkin 1990 (1992): 78, fig. 19d (description by Kruglov et Starobogatov);

Kruglov and Starobogatov 1991: 75, fig. 2, *10* (description as *A. (Acroloxus*), key to identification, distribution – probably in Upper Zeya, Ud, and North Sakhalin zoogeographical provinces));

Prozorova 1991a (mentioned for basins of rivers entering southern Japan Sea, basins of Khanka Lake and Ussuri River);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Prozorova and Zasypkina 2005; Prozorova et al. 2009 (record from Khilok River, Selenga River basin);

Zasypkina 2008 (record from Gorchaki River, Upper Amur basin);

Prozorova 2010 (as *A.* (*Amuroacroloxus*), reproductive system morphology, records from Hokkaido, Japan);

Shirokaya et al. 2011 (record from Chivyrkui Bay, Baikal Lake);

Pietsch et al. 2012 (records from Tym River area and Poronay River and Poronaisk mountain areas in Sakhalin Island);

Prozorova 2013a, b (mentioned for malacofauna of southern continental waterbodies of Russian Far East);

Vinarski and Kantor 2016 (information about types, type locality, distribution, 'bionomics');

GBIF Backbone Taxonomy 2016 (as a synonym of *A. hassanicus*);

Shirokaya et al. 2017 (general information on species: photo of the types, measurements, comparison with *A. bai-*

calensis, records, references; taxonomical remarks, key to identification).

Type locality. Spring connecting lake Kotika with Tym River (50 km from outlet), Sakhalin Island.

Types. Holotype (dry) No. 1 (coll. Taranets), 5 paratypes (in alcohol) from Krugloe Lake of Zeya River basin (coll. Bogatov, 1975).

Additional records. Absent in ZIN collection, see 'History".

Ecology. Collected on water vegetation of lakes and small slow-flowing rivers (label data). Found together with *A. baicalensis* in Lake Baikal (Shirokaya et al. 2011).

8. *Acroloxus kolhymensis* Prozorova et Starobogatov, 1998

(Fig. 2I–K)

History of the name application.

Prozorova and Starobogatov 1998a: 39–41, figs. 1A, 2A–B (description as *A. (Acroloxus*), reproductive system morphology);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Dolgin 2009 (mentioned for Yano-Kolyma zoogeographical province in Siberia);

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics');

GBIF Backbone Taxonomy, 2016 (as a synonym of *A. hassanicus*).

Type locality. Shchuchye Lake, lower Kolyma basin in vicinities of Cherskyi settlement.

Types. Holotype (in alcohol, totally destroyed): No. 1, and 1 paratype (in alcohol) from type locality (coll. K. Regel, 1995): No. 2.

Additional records. Absent in ZIN collection. Endemic of the Kolyma River basin (Prozorova and Starobogatov 1998a).

Ecology. Found in lakes, on water vegetation (Prozorova and Starobogatov 1998a); collected together with types of *A. regelae*.

9. *Acroloxus regelae* Prozorova et Starobogatov, 1998

(Fig. 2L)

History of the name application.

Prozorova and Starobogatov, 1998a: 41–42, figs. 1B, 2C (description as *A.* (*Acroloxus*), copulatory apparatus morphology);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev, 2005; Kantor et al., 2010 (information about types, type locality and general distribution);

Dolgin, 2009 (mentioned for Yano-Kolyma zoogeographical province in Siberia);

Shirokaya et al., 2011 (mention);

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics');

GBIF Backbone Taxonomy 2016 (as a synonym of *A. hassanicus*).

Type locality. Shchuchye Lake, lower Kolyma basin in vicinities of Cherskyi settlement.

Types. Holotype (dry): No. 1 (coll. K. Regel, no date), and 1 paratype in alcohol from Shchuchye Lake (Kolyma area, coll. K. Regel, no date)

Additional records. Absent in ZIN collection. Possibly an endemic of the Kolyma area (Prozorova and Starobogatov, 1998).

Ecology. Found on water vegetation, on sunken wood, sometimes on waterbody bottom (Prozorova and Starobogatov, 1998a).

10. *Acroloxus kluchareva* Kruglov et Starobogatov, 1991

(Fig. 2M–O)

History of the name application.

Bogatov and Zatrawkin 1990 (1992) (shell description by Kruglov et Starobogatov, key to identification, distribution);

Kruglov and Starobogatov 1991: 78, fig. 1 (6) (description as *A.* (*Amuracroloxus*), key to identification);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Shirokaya et al. 2011 (mention);

Pietsch et al. 2012 (records from Tym River area and Poronay River and Poronaisk mountain areas in Sakhalin Island);

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics');

GBIF Backbone Taxonomy 2016 (as a synonym of *A. hassanicus*).

Type locality. Bolshoe Vavayskoe Lake, near Aniva Bay, south Sakhalin Island.

Types. Holotype (in alcohol): No. 1.

Additional records. Absent in ZIN collection.

Ecology. The holotype was collected on small pebbles, depth 2.6 m (label data, O. Kluchareva, 1959).

11. *Acroloxus hassanicus* Kruglov et Starobogatov, 1991
(Fig. 2P–Q)

History of the name application.
Bogatov and Zatrawkin 1990 (1992) (shell description by Kruglov et Starobogatov, key to identification, distribution);
Kruglov and Starobogatov, 1991: 77, fig. 1 *4*, 3 *5* (description as *A.* (*Amuracroloxus*), reproductive system morphology, key to identification, Amur-Primorye species possibly reaching Pribaikalye – lakes of the Kichera River valley);
Prozorova 1991a (mentioned for basins of rivers entering the southern Japan Sea, basin of Khanka Lake and Ussuri River);
Prozorova 1991b (1992) (records from Sirenevka River basin (small lake), vicinity of Razdolnoye settlement (Nadezhdinskiy District, Primorye Territory; egg-clusters morphology);
Prozorova 1992 (records from permanent small waterbodies of Primorye Territory);
Prozorova 2000 (record from riverbeds of Komissarovka and Melgunovka rivers with riverbeds of Komissarovka and Melgunovka rivers with channela, Prikhankayskaya lowland);
Prozorova 2001 (record from Lotos Lake, basin of Tumannaya lower stream);
Prozorova 2004 (record from lake on Bolshoi Pelis Island);
Starobogatov et al. 2004 (key to identification, general distribution);
Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);
Shirokaya et al. 2011 (record from Khilok River, Selenga River basin);
Pietsch et al. 2012 (records from Tym River area and west mountain area in Sakhalin Island);
Prozorova 2013a, b (mentioned for malacofauna of southern continental waterbodies of Russian Far East);
Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Poima River (former Adimi), near Bamburovo village, Khasan District, Primorye Territory (Far East). (The holotype label contains information that it was collected in an unnamed ox-bow in the floodplain of the Adimi River).

Types. Holotype (in alcohol): No. 1; 14 paratypes (in alcohol): No. 2 (5) – bog southeasternward of Mo (= Melgunovka) River mouth, Khasan district, Primorye Territory (coll. Ya. Starobogatov, 1956); No. 3 (5 spms) and No. 4 (4 spms) – Doritzine (= Lotos) Lake, Khasan District (coll. Ya. Starobogatov, 1956).

Additional records. Absent in ZIN collection. See "History".

Ecology. The holotype was collected from a silty willow branch. Lives in clean lakes and slowly flowing rivers, on vegetation, stones and hard objects (Prozorova 2001).

12. *Acroloxus ussuriensis* Moskvicheva, Kruglov et Starobogatov in Kruglov et Starobogatov, 1991
(Fig. 2R–T)

History of the name applications.
Moskvicheva 1974 (nomen nudum);
Bogatov and Sirotski, 1978 (nomen nudum);
Zatrawkin and Bogatov, 1983 (nomen nudum)
Kruglov and Starobogatov 1991: 76–77, fig. 1 *3*, 3 7 (description as *A.* (*Amuracroloxus*), copulatory organ morphology, key to identification, Amur-Primorye species);
Bogatov and Zatrawkin 1990 (1992) (description by Moskvicheva, Kruglov et Starobogatov, information about holotype, ecology and distribution);
Prozorova 1991b (1992) (egg-clusters morphology of specimens from Komissarovka River near Rubinovka village, Primorye Territory);
Prozorova 2000 (record from riberbeds of Komissarovka and Melgunovka with branches; Near-Khanka lowland);
Prozorova 2004 (record from lake on Bolshoi Pelis Island);
Starobogatov et al. 2004 (key to identification, general distribution);
Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);
Zasypkina 2008 (records from Ingoda, Shilka, Amazar and Gorchaki rivers of Upper Amur River);
Prozorova 2013a, b (mentioned for malacofauna of southern continental waterbodies of Russian Far East);
Vinarski and Kantor 2016 (information about types, type locality, distribution, 'bionomics');
GBIF Backbone Taxonomy 2016 (as a synonym of *A. hassanicus*).

Type locality. Malyi Sungachik River, 1 km from the mouth (Russian Far East).

Types. Holotype (dry): No. 1; paratypes: 3 shells from type locality (coll. Voinarovskiy, 1932): No. 2; 2 shells from bog near Nikolsk city (southward of Ussuriisk) (coll. V. Velichkovski, 1924): No. 3; other in alcohol: 4 spms – meadow at Melgunovka (= Mo) River mouth (coll. Ya. Starobogatov, 1956): No. 4; 5 spms – floodland at Varfalomeevka settlement (Yakovlevsky District) (coll. Ya. Starobogatov, 1956): No. 5; 4 spms – Tudo-Vaku (Malinovka) River, Dalnerechensk District (coll. Ya. Starobogatov, 1958): No. 6; 1 spm – Khanka Lake basin, at Vladimiro-Petrovka settlement (coll. N. Nasonov, 1926): No. 7; 5 spms – Suputinsky Reserve (coll. I. Likharev, 1946):

No. 8, 5 spms – same locality (coll. I. Likharev, 1946): No. 9; 6 (1 and 5) spms – Khor River basin (coll. I. Levanidova, 1949): No. 10, 11; 1 spm – Mangorka River (Khabarovsk Territory) (coll. I. Levanidova, 1949): No. 12; 1 spm – brook at Bolon village (Khabarovsk Territory) (coll. I. Levanidova, 1949): No. 13; 1 spm – spring at Tudo-Vaku (Malinovka) River (coll. I. Levanidova, 1949): No. 14; 7 spms – lake 16 km westward of Ariadnoye village, Ussuri River basin (coll. I. Levanidova, 1949): No. 15; 2 spms – Si River (Ternei District), 4 km from the mouth, Amur River basin (coll. I. Levanidova, 1949): No. 16; 1 spm – Tunguska River (Amur tributary) (coll. V. Dvoriadkin, 1973): No. 17. All were identidied by I. Moskvicheva.

Additional records. Shallow-water bay near mouth of Odyr River, Chirka River basin (Khabarovsk Territory) (coll. I. Moskvicheva, 1985, det. Ya. Starobogatov) (ZIN).

Ecology. Found on stones and on water vegetation, at depth of 0.4–0.5 m (label data). Lives in rivers and lakes, on vegetation and on gravel-pebble bottom (Bogatov and Zatrawkin 1990 (1992)).

13. *Acroloxus likharevi* Moskvicheva, Kruglov et Starobogatov in Kruglov et Starobogatov, 1991
(Fig. 2U–W)

History of the name applications.

Kruglov and Starobogatov 1991: 75–76, fig. 1 *2*, 3 *5–6* (description, reproductive system morphology, key to identification, distribution);

Bogatov and Zatrawkin 1990 (1992) (information about types, shell morphology, ecology and distribution);

Prozorova 1991a (mentioned for basins of rivers entering the southern Japan Sea; basins of Khanka Lake and Ussuri River);

Prozorova 1991b (1992) (records from waterbodes near Barabash-Levada settlement, bog at Zharikovo settlement, Khasan District, Primorye Territory; egg-clusters morphology);

Prozorova 2000 (record from riverbeds of Komissarovka and Melgunovka rivers with their channels, Near-Khanka lowland);

Kolpakov 2003; Prozorova and Kolpakov 2004 (mentioned for southern part of central and northern part of north Primorye zoogeographical province);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Albrecht et al. 2007 (divergence from possible common ancestor, North American *A. coloradensis*, 2.4 ± 0.48 MYA);

Potikha et al. 2008 (record from Serebryanka River, Sikhote-Alin Reserve);

Shirokaya et al. 2011 (mention);

Pietsch et al. 2012 (records from Tym River area in Sakhalin Island);

Prozorova 2013a, b (mentioned for malacofauna of southern continental waterbodies of Russian Far East);

Stelbrink et al. 2015 (position on molecular-phylogenetic tree);

Vinarski and Kantor 2016 (information about types, type locality, distribution, 'bionomics');

GBIF Backbone Taxonomy, 2016 (as a synonym of *A. hassanicus*).

Type locality. Olenevka River, basin of the River (Suifun) Razdolnaya near Nikolsk-Ussuriysk, Far East (coll. Dulkeit, 1924).

Types. Holotype (dry): No. 1; 8 paratypes: 2 shells from pond in hippodrome of Vladivostok city (coll. A. Taranetz, 1934): No. 2; other in alcohol: 2 spms – brook at road to Vladivostok (coll. I. Levanidova, 1949: No. 3); 1 spm. – Pavlinovskaya channel, Khor River, Khabarovsk Territory (coll. I. Levanidova, 1949): No. 4; 1 spm. – Potopilis channel, Khor River, Khabarovsk Territory (coll. I. Levanidova, 1949): No. 5; 1 spm. – Ditch at Olgokhta station, Tunguska River Basin, Khabarovsk Territory (coll. V. Dvoriadkin, 1973): No. 6. All were identifiyed by I. Moskvicheva.

Additional records. Arsenjevka River at Yakovlevka village (coll. I. Sokolov, 1927; det. I. Moskvicheva); small lake in Ussuri Territory (coll. I. Sokolov, 1927, det. I. Moskvicheva); waterbody in Ussuri River basin near Pereyaslavka settlement (coll. and det. I. Moskvicheva, 1978); Khurmuli River at Khurmuli settlement, Khabarovsk Territory (coll. I. Moskvicheva, 1984, det. Ya. Starobogatov); Tugur River, Khabarovsk Territory (coll. I. Moskvicheva, 1972; det. Starobogatov) (ZIN).

Ecology. Collected on pebbles and boulders (label data).

14. *Acroloxus zarjaensis* Kruglov et Starobogatov, 1991
(Fig. 2X–Z)

History of the name application.

Bogatov and Zatrawkin 1990 (1992) (description by Kruglov et Starobogatov);

Kruglov and Starobogatov 1991: 77–78, fig. 1 *5* (description as *A.* (*Amuracroloxus*), key to identification);

Prozorova 1991a (mentioned for basins of rivers (up to the Tuman River) entering the northern Japan Sea);

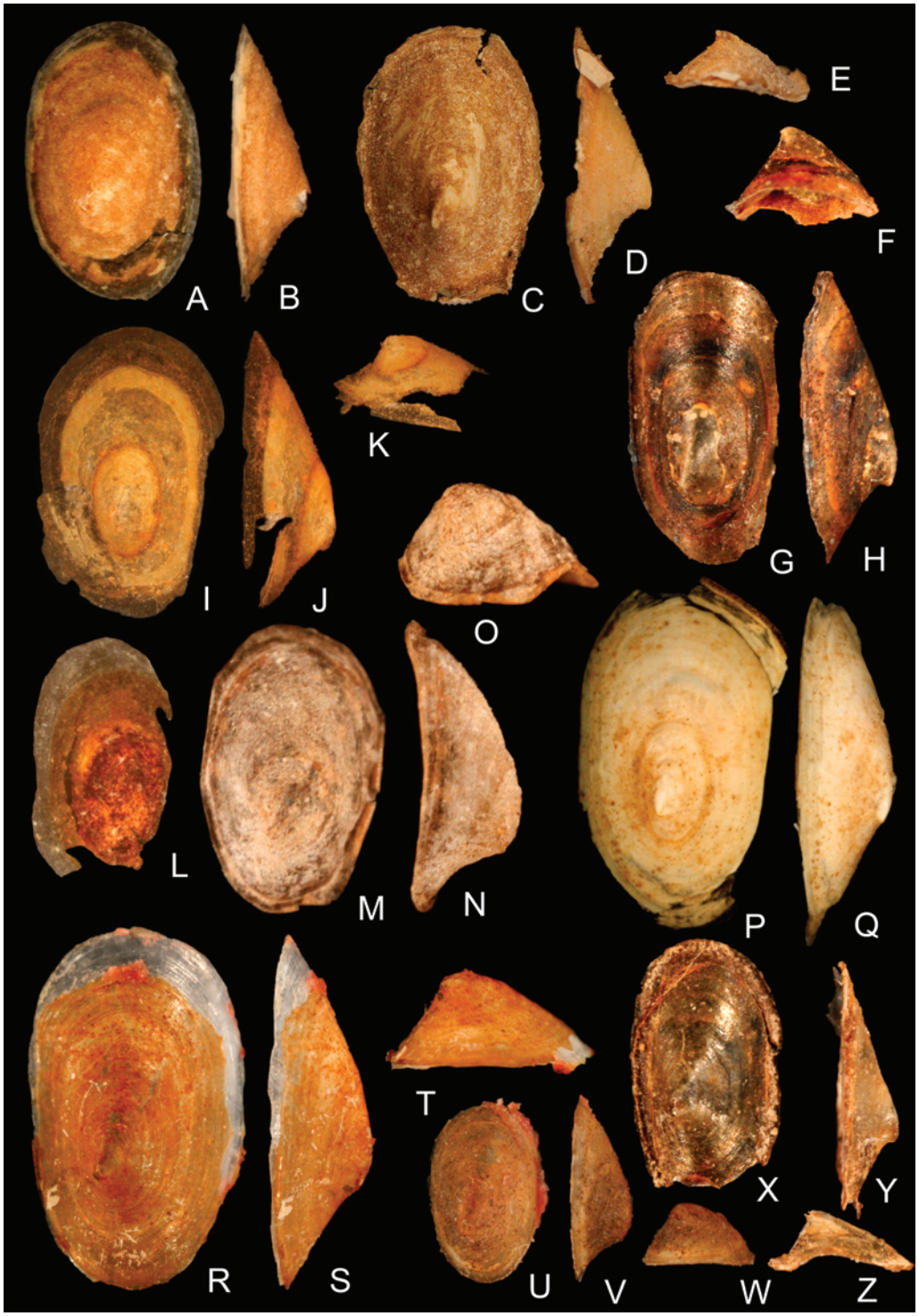

Fig. 2. A–B – *Acroloxus arachleicus*, holotype, L = 3.9 mm; C–E – *Acroloxus arachleicus*, paratype No. 2, L = 4.3 mm; F–H – *Acroloxus orientalis*, holotype, L = 4.5 mm; I–K – *Acroloxus kolhymensis*, paratype No. 2, L = 4.8 mm; L – *Acroloxus regelae*, holotype, L = 2.5 mm; M–O – *Acroloxus klucharevae*, holotype, L = 3.7 mm; P–Q – *Acroloxus hassanicus*, holotype, L = 5.1 mm; R–T – *Acroloxus ussuriensis*, holotype, L = 5.6 mm; U–W – *Acroloxus likharevi*, holotype, L = 3.1 mm; X–Z – *Acroloxus zarjaensis*, holotype, L = 3.7 mm.

Starobogatov et al. 2004 (key to identification, general distribution);

Kolpakov 2003; Prozorova and Kolpakov, 2004 (mentioned for southern part of Central Primorye zoogeographical province);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Pietsch et al. 2012 (records from five areas in Sakhalin Island);

Prozorova 2013a, b (mentioned for malacofauna of southern continental waterbodies of Russian Far East);

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics');

GBIF Backbone Taxonomy 2016 (as a synonym of *A. hassanicus*).

Type locality. Lake Zarya, Lazovsk Reserve, Primorye (coast of the Japan Sea).

Types. Holotype: No. 1 (coll. V. Bogatov, 1986).

Additional records. Absent in ZIN collection.

Ecology. Lives in clear, stagnant or slowly flowing water with high saturation with oxygen. Inhabits water vegetation, stones and other hard substrates. Feeds on algae and bacteria of periphyton, scraping them off from the substrate. Life cycle lasts one year, breeds in May-July, with small colorless transparent egg-clusters firmly attached to flat surfaces and containing 1–3 egg capsules (Prozorova 2005).

HETEROBRANCHIA Burmeister, 1837

VALVATIDAE Gray, 1840

VALVATINAE Gray, 1840

Starobogatov with his disciples (Starobogatov in Sitnikova 1983; Starobogatov et al. 2004) recognized three genera within the subfamily Valvatinae of the ex-USSR fauna: *Valvata* Müller, 1774 (with subgenera *Valvata* st. str. and *Microvalvata* Sitnikova, 1983), *Cincinna* Férrusac, 1821 (with subgenera *Atropidina* Lindholm, 1906, *Sibirovalvata* Starobogatov et Streletzkaja, 1967, *Pamirocincinna* Sitnikova et Starobogatov 1983, and *Pseudomegalovalvata* Kozhov, 1936) and *Megalovalvata* Lindholm 1909. The presence of more than 60 (62) species of Valvatinae in waterbodies of Russia and adjacent countries (Starobogatov et al. 2004; Sitnikova et al. 2004) required a systematization, i.e. a system of taxa of generic and subgeneric rank as well as sections (Starobogatov and Zatrawkin 1985; Bogatov and Zatrawkin 1990 (1992)). In recent years, all extant species of the subfamily are considered within a single genus *Valvata* with several subgenera (Bouchet and Rosenberg, 2015; Vinarski and Kantor, 2016). Molecular-phylogenetic tree (Clewing et al. 2014) shows that valvatids are grouped into several clades with still uncertain taxonomic rank. We cite the species within the genera where they have been described by Starobogatov and coauthors. Complete information about taxa of the family, including references, was given by Haszprunar (2014).

15. *Valvata lietuvensis* Chernogorenko et Starobogatov, 1987

(Fig. 3A–C)

History of the name application.

Chernogorenko and Starobogatov 1987b: 149 (description as *V.* (*Microcincinna*));

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Haszprunar, 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Valvata*), information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Vyshtitis Lake, at the border of Kaliningrad Province (Russia) and Lithuania.

Types. Holotype (dry): No. 1, and 10 paratypes (dry) from type locality (coll. Ya. Starobogatov, 1966): No. 2 and 3.

Additional records. Absent in ZIN collection.

Ecology. Snails were collected at the depth of 1.5 to 3 m, on sandy bottom with vegetation (label data).

16. *Valvata vystitiensis* Chernogorenko et Starobogatov, 1987

(Fig. 3D–F)

History of the name application.

Chernogorenko and Starobogatov 1987b: 148 (description as *V.* (*Microcincinna*));

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Haszprunar 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Valvata*); information about types, type locality with coordinates, distribution, 'bionomics').

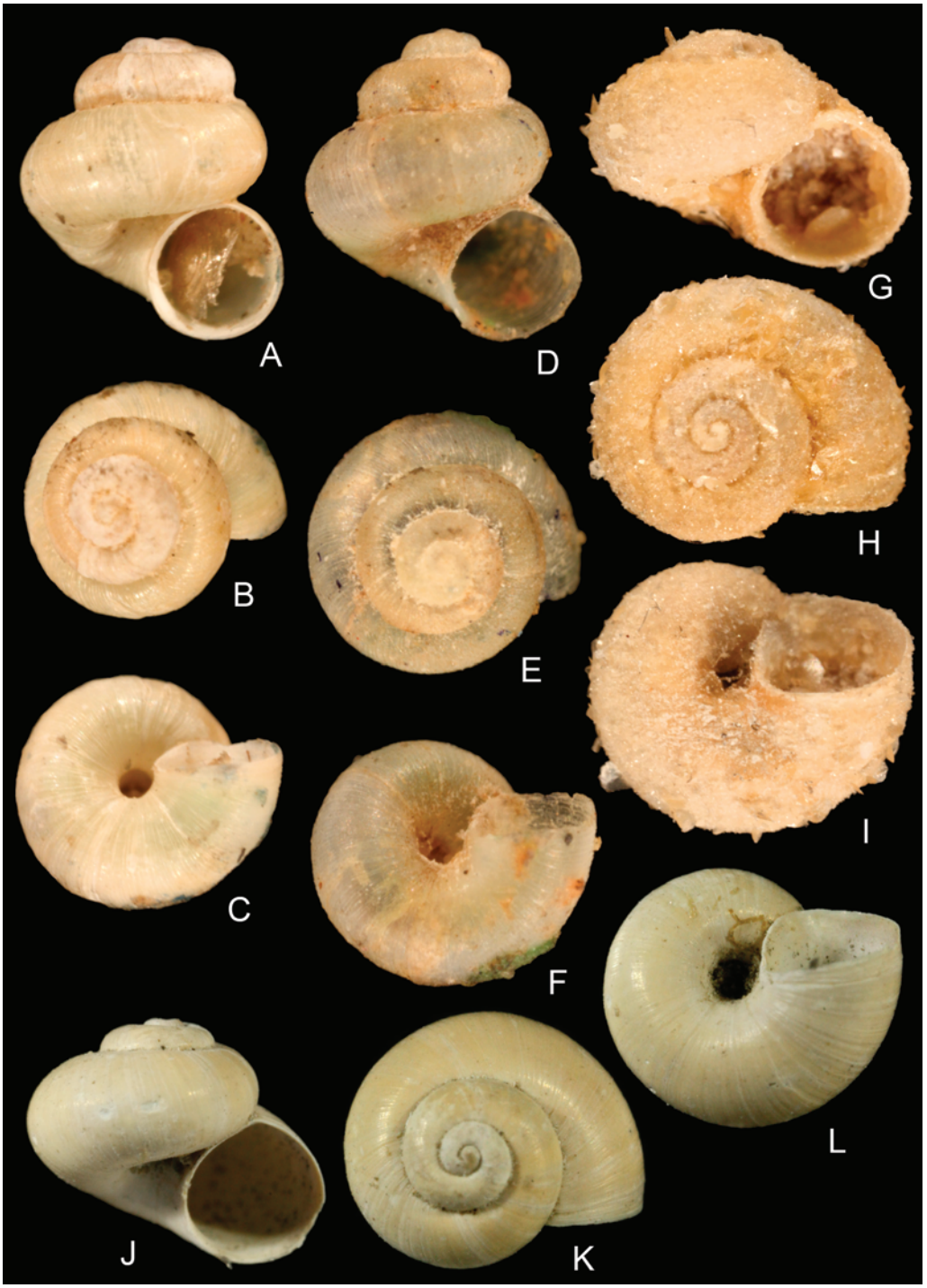

Fig. 3. A–C – *Valvata lietuvensis*, holotype, H = 2.8 mm; D–F – *Valvata vystitiensis*, holotype, H = 3.0 mm; G–I – *Cincinna pamirensis*, holotype, H = 3.5 mm; J–L – *Cincinna pamirensis*, paratype No. 10, type locality, H = 3.2 mm.

Type locality. Vyshtitis Lake, at the border of Kaliningrad Province and Lithuania.

Types. Holotype (dry): No. 1; paratypes: 1 shell from Instruch River near Prirechnyi settlement, Kaliningrad Province (coll. Ya. Starobogatov, 1966; det. E. Chernogorenko): No. 2 and 1 shell from type locality (coll., det. Ya. Starobogatov, 1966): No. 3.

Additional records. Absent in ZIN collection.

Ecology. Collected from water vegetation thickets, near the shore (label data). According to ZIN collection, in Lake Vyshtitis two species, *V. lietuvensis* and *V. vystitiensis*, were found together with four other valvatids: *V. trochoidea* Menke, 1845, *V. planorbulina* Paladilhe, 1867, *Cincinna dilatata* (Eichwald, 1830), and *C. piscinalis* (Müller, 1774). Three valvatid species, *C. dilatata*, *C. piscinalis*, and *C. obtusa* (Draparnaud, 1801), were detected together with *V. vystitiensis* in the Instruch River (ZIN collection).

Remarks. These two very similar conchologically species, assigned by Starobogatov and Chernogorenko to *Valvata* (*Microcincinna*), resemble the shell of *V. geyeri* Menzel, 1900, which is usually considered (not in Russian literature) as a subspecies taxon within *V. piscinalis* (e.g. Glöer 2002).

17. *Cincinna pamirensis* (Starobogatov, 1972)

(Fig. 3G–L)

History of the name application.

Starobogatov and 1972: 170–171, fig. 9 (description as *Valvata* (*Cincinna*));

Sitnikova and Starobogatov in Sitnikova 1983 (the type species of *C.* (*Pamirocincinna*));

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Haszprunar 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Cincinna*); information about types, type locality, distribution, 'bionomics').

Type locality. Tajik SSR, Gorno-Badakhshan Autonomous Province, Shaimak, 7 km from Kyzyl-Ravat, warm spring on right bank of the Aksu River (sample 136).

Types. Holotype (dry): No. 1, paratypes: 67 in alcohol from the same sample of type locality (coll. A. Yankovskaya, 1948): No. 2; others from type locality but from other days of August, 1948 under sample numbers – 127 (10 in alcohol): No. 3, 128 (5 in alcohol): No. 4, 130 (38 in alcohol): No. 5; 134 (88 in alcohol): No. 6; 142 (165 in alcohol and 12 dry): No. 7 (det. by Z. Izzatulaev as *Valvata gafurovi*); 145 (2 in alcohol): No. 8; 133 (4 dry): No. 9 (det. by Z. Izzatulaev as *Valvata gafurovi*); and a lot of shells under No. 10 (without exact data and number of sample).

Additional records. Yashillul, South Pamir (coll. A. Yankovskaya, 1948; det. Ya. Starobogatov).

Ecology. Dweller of thermal springs.

18. *Cincinna chersonica* Chernogorenko et Starobogatov, 1987

(Fig. 4A–C)

History of the name application.

Chemogorenko and Starobogatov 1987b: 150 (shell description as *C.* (*Cincinna*), distribution – from upper and middle reaches of Dnieper River to South Altai; possibly also southern Europe and southern Kazakhstan);

Chernogorenko 1991 (re-description, distribution);

Anistratenko 1998 (key to identification, distribution);

Anistratenko and Anistratenko 2001 (key to identification, shell description, distribution);

Starobogatov et al. 2004 (key to identification, general distribution: southern areas of Eastern Europe to Altai, rivers);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Vinarski et al. 2007 (2008) (records from Irtysh zoogeographical province in Western Siberia);

Dolgin 2009 (mentioned for Irtysh zoogeographical province in Siberia);

Haszprunar 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Cincinna*); information about types, type locality, distribution, 'bionomics').

Type locality. Mouth of Dnieper River.

Types. Holotype (lost); paratype (dry) from plant-filled channel of Irtysh near Predgornoye village, East Kazakhstan (coll. L. Krivosheina, 1970, initially identified by L. Krivosheina as *V. ambiqua*).

Additional records. Komi Autonomous Republic, Mezen River, 0.5 km upstream of Elva River mouth (coll., det. Ya. Starobogatov, 1970).

Ecology. Found on bottom with water vegetation (label data).

19. *Cincinna falsifluviatilis* Starobogatov in Anistratenko et Anistratenko, 2001

(Fig. 4D–G)

History of the name application.

Anistratenko, 1998: Table II, Fig. 17 (as *Cincinna fluviatilis*, key to identification, distribution);

Anistratenko and Anistratenko, 2001: 139–140. fig. 110 (as *Cincinna falsifluviatilis*; description by Starobogatov – nom. nov. pro *Valvata fluviatilis* sensu Westerlund, 1886: 34 (actually, 134); non Colbeau, 1859);

Starobogatov et al. 2004 (as *C.* (*Cincinna*), key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution, not available species);

Starobogatov et al. 2004 (as erroneous references – Starobogatov in 1996; key to identification, general distribution: European rivers);

Kantor and Sysoev 2005; Kantor et al. 2010 (concluded that the name is unavailable);

Vinarski et al. 2007 (2008) (record from Irtysh and Middle Ob zoogeographical provinces in Western Siberia)

Vinarski et al 2007 (mentioned for Ilmeny State Reserve);

Beriozkina 2011 (egg-clusters morphology and size);

Dolgin 2009 (mentioned for Irtysh and Middle Ob zoogeographical provinces in Siberia);

Haszprunar 2014 (as a synonym of *Valvata contorta* Colbeau, 1859);

Kijashko et al. 2016 (key to identification);

Vinarski and Kantor 2016 (as *Valvata* (*Cincinna*), information about types, type locality, distribution, 'bionomics'; not available species).

Type locality. "Belgien, England, Deutschland, Russland".

Types. Syntypes (possible) 3 shells: No. 1, Germany, Vegesack – northern district of Bremen (coll.? and det. Westerlund).

Additional records. The ZIN catalog lacks records about reidentification of *C. fluviatilis* by Ya. Starobogatov; nevertheless there are data on material which contains more than 250 spms identified as *Valvata* (*Cincinna*) *fluviatilis* Colbeau – by Lindholm (Nos. 2–8, 10, 31) from the Luga, Oka, Moskva, Ilmen rivers, and by Shadin (Nos. 9, 11–27, 33–39), also collected by him in the Oka and Sukhona rivers, as well as in ponds and backwaters in vicinities of Murom city; by Milashevich (Nos. 28–30, 40) from waterbodies of vicinities of Pronsk and Voronezh cities as well as Luzhki in Moscow Province; by L. Krivosheina (Nos. 41, 42) from tributaries of the Irtysh, as well as by Starobogatov (Nos. 43 and Nos. 1–4), as *Cincinna fluviatilis*, from vicinities of Ust-Kamenogorsk city (East Kazakhstan), Vyshtitis Lake, Instruch River and former riverbed near Ozerki settlement (Kaliningrad Province), as well as subfossil shells collected by I. Kuznetsov in shore steeps of the Danube near Izmail city.

Ecology. Collected on soft bottom and from water vegetation at depths of up to 5 m (label data).

Remarks. We give here photographs of two shells, which most probably were regarded as *C. falsifluviatilis* by Ya.I. Starobogatov, because these shells were firstly detected by C. Westerlund as *V. fluviatilis* (see catalog of ZIN). One shell (Fig. 4D) is similar to the drawing presented by Starobogatov in Anistratenko and Anistratenko (2001, Fig. 110).

20. *Cincinna bureensis* Starobogatov et Zatrawkin, 1985

(Fig. 4H–M)

History of the name application.

Starobogatov and Zatrawkin 1985: 1158, fig. 6 (description as *C.* (*Sibirovalvata*), section *Alienella* Starobogatov et Zatrawkin, 1985, key to identification, comparison with *C. sibirica*, records from middle reaches of Bureya River, Manoma River floodland, Anyui River tributary, Lower Amur basin);

Bogatov and Zatrawkin, 1990 (1992) (description, key to identification, general information);

Prozorova and Starobogatov 1998b (shell drawing, key to identification, distribution);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Zasypkina 2008 (records from Onon and Ingoda rivers of Upper Amur River basin);

Prozorova 2013a, b (mentioned for malacofauna of southern continental waterbodies of Russian Far East);

Haszprunar 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Sibirovalvata*), information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Lake on the left bank of the River Bureya, near Chekunda (old) settlement, Khabarovsk Territory (Far East).

Types. Holotype (in alcohol): No. 1, paratypes: 18 shells (No. 2) and 23 spms in alcohol (No. 7) from type locality (coll. M. Zatrawkin, V. Bogatov, 1980); 4 dry spms from Chekundushka River floodland, Zeya River basin (coll. M. Zatrawkin, 1980): No. 3; 6 spms in alcohol – Manoma River, tributary of Anyui River, near Nizhnyaya Manoma settlement (coll. M. Zatrawkin, 1980): No. 5.

Additional records. Tugur River near Tugur settlement, Khabarovsk Territory (coll. I. Moskvicheva, 1972, det. L. Prozorova). Similar in shape shells were

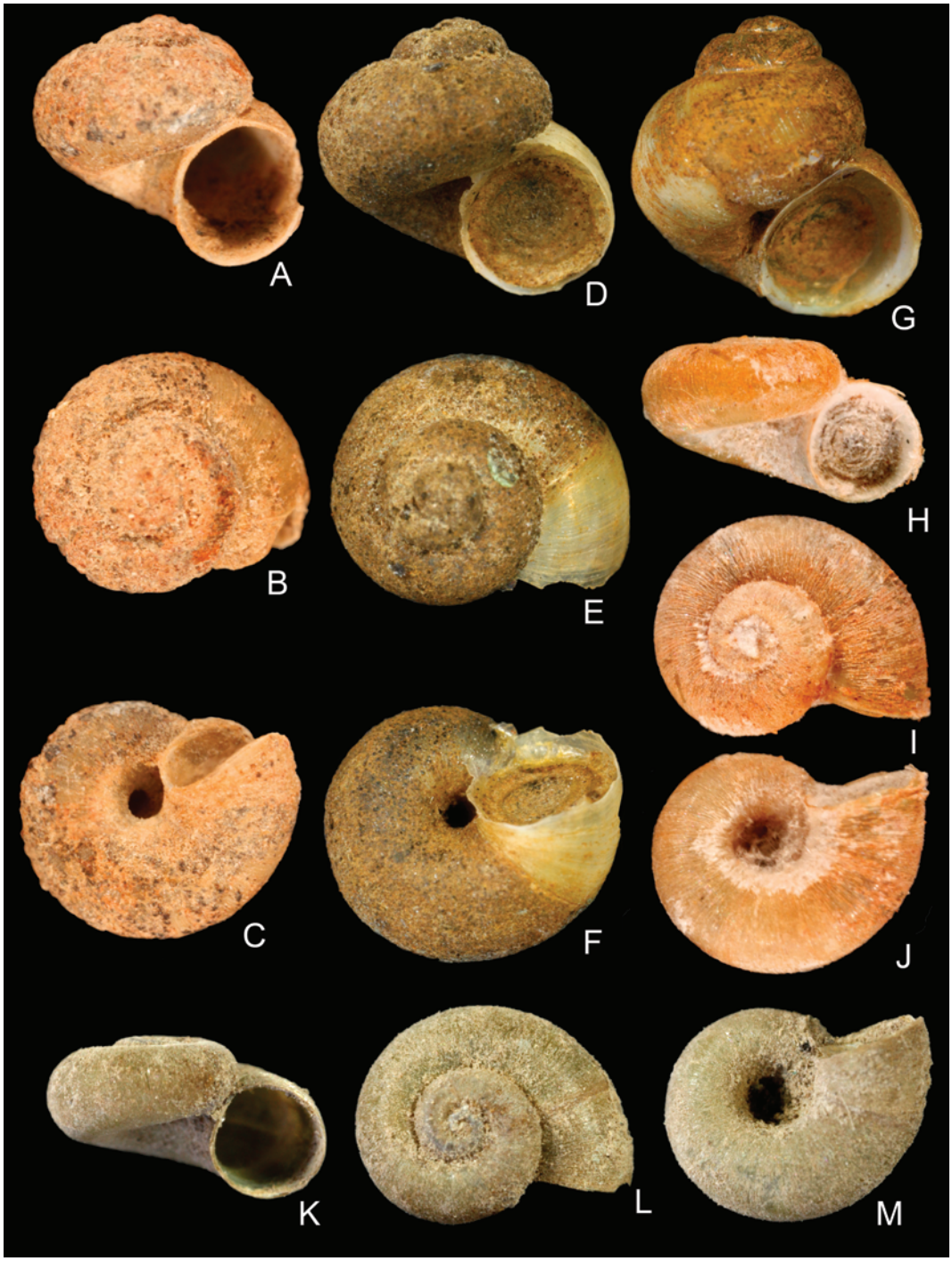

Fig. 4. A–C – *Cincinna chersonica*, paratype No. 1, H = 3.6 mm; D–F – *Cincinna falsifluviatilis*, possible syntype, Germany, Vegesack, No. 1, H = 4.4 mm; G – *Cincinna falsifluviatilis*, possible syntype, Germany, Vegesack, No. 1, H = 4.8 mm; H–M – *Cincinna bureensis*, holotype, H = 2.8 mm; K–M – *Cincinna bureensis*, paratype No. 2, H = 2.7 mm.

found in lakes of the Barguzin River basin, Dzherginsky Reserve (coll. D. Matafonov, det. L. Prozorova).

Ecology. Lives in permanent waterbodies (Prozorova and Starobogatov 1998b).

21. *Cincinna kamchatica* Prozorova et Starobogatov, 1998

(Fig. 5A–C)

History of the name application.

Prozorova and Starobogatov 1998b: 63, 65, fig. 3A (description as *C.* (*Sibirovalvata*), key to identification, records from Kolyma River basin);

Prozorova and Shed'ko 2003 (record from Ajabachie Lake);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Dolgin 2009 (mentioned for Yano-Kolyma zoogeographical province in Siberia);

Haszprunar 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Sibirovalvata*), information about types, type locality, distribution, 'bionomics').

Type locality. Eastern Kamchatka, puddle on Bolshoi Kamchatskyi Island in the valley of Kamchatka River.

Types. Holotype (dry): No. 1.

Additional records. Absent in ZIN collection.

Ecology. Lives in small waterbodies (Prozorova and Starobogatov, 1998b). According to Prozorova and Shed'ko (2003), *C. kamchatica* completely displaces *C. sibirica* in Eastern Kamchatka.

22. *Cincinna chereshnevi* Bogatov, Zatrawkin et Starobogatov in Bogatov et Zatrawkin, 1990 (1992)

(Fig. 5D–F)

History of the name application.

Bogatov and Zatrawkin 1990 (1992): 35–36, fig. 8 а–в (a–v) (description as *C.* (*Sibirovalvata*) section *Sibirovalvata,* key to identification, type locality only);

Prozorova 1998 (record from Khatyrka River basin, Koryak mountains);

Prozorova and Starobogatov 1998b (shell drawing, key to identification, distribution);

Starobogatov et al. 2004 (key to identification, general distribution: glacial lakes of southern Chukchi Peninsula (basin of Khatyrka River) and northern Okhotsk Sea maritime area);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Haszprunar 2014 (information about types, type locality, original and main sources);

Vinarski and Kantor 2016 (as *Valvata* (*Sibirovalvata*), information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Southern Chukchi Peninsula, basin of Khatyrka River, Lake Egergytgyn.

Types. Holotype (dry): No. 1 (coll. I. Chereshnev, 1987).

Additional records. Komi Autonomous Republic, Mezen River, 0.5 km upstream of Elva River mouth, near the shore (coll., det. Ya. Starobogatov, 1970, ZIN). Khatyrka River basin, Koryak mountains (Prozorova 1998b).

Ecology. Lives in shallow water, on mixed bottom deposits with water vegetation (label data).

23. *Cincinna chishimana* Prozorova et Starobogatov, 1999

(Fig. 5G–I)

History of the name application.

Prozorova Starobogatov, 1999: 54–55, figs. 2B, 3 (description as *C.* (*Sibirovalvata*), reproductive system morphology, comparison with *C. japonica*, endemic of Iturup Island);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution, error in synonymy, = C. *kizakikoensis* Fujita et Habe, 1991, because Prozorova, Starobogatov, 1999 mentioned that C. *kizakikoensis* is synonym of *C. japonica* (Martens, 1877));

Haszprunar 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Sibirovalvata*), information about types, type locality, distribution, 'bionomics').

Type locality. Iturup Island, Reidovoye Lake.

Types. Holotype (dry): No. 1 (coll. L. Prozorova, 1994); 14 paratypes in alcohol from Lake Lebedinoye, Iturup Island (coll. L. Prozorova, 1994): No. 2.

Additional records. Lake in 1–1.5 km from river flowing out of Blagodatnoye Lake, Iturup Island (coll. N. Zarenkov, 1956, det. L. Prozorova); Lebyazhye Lake, Iturup Island (coll. S. Popova, 1980; A. Golikov, 1969, det. L. Prozorova).

Ecology. Found in shallow water (down to 2 m depth), on sandy-muddy bottom with detritus and water vegetation (label data).

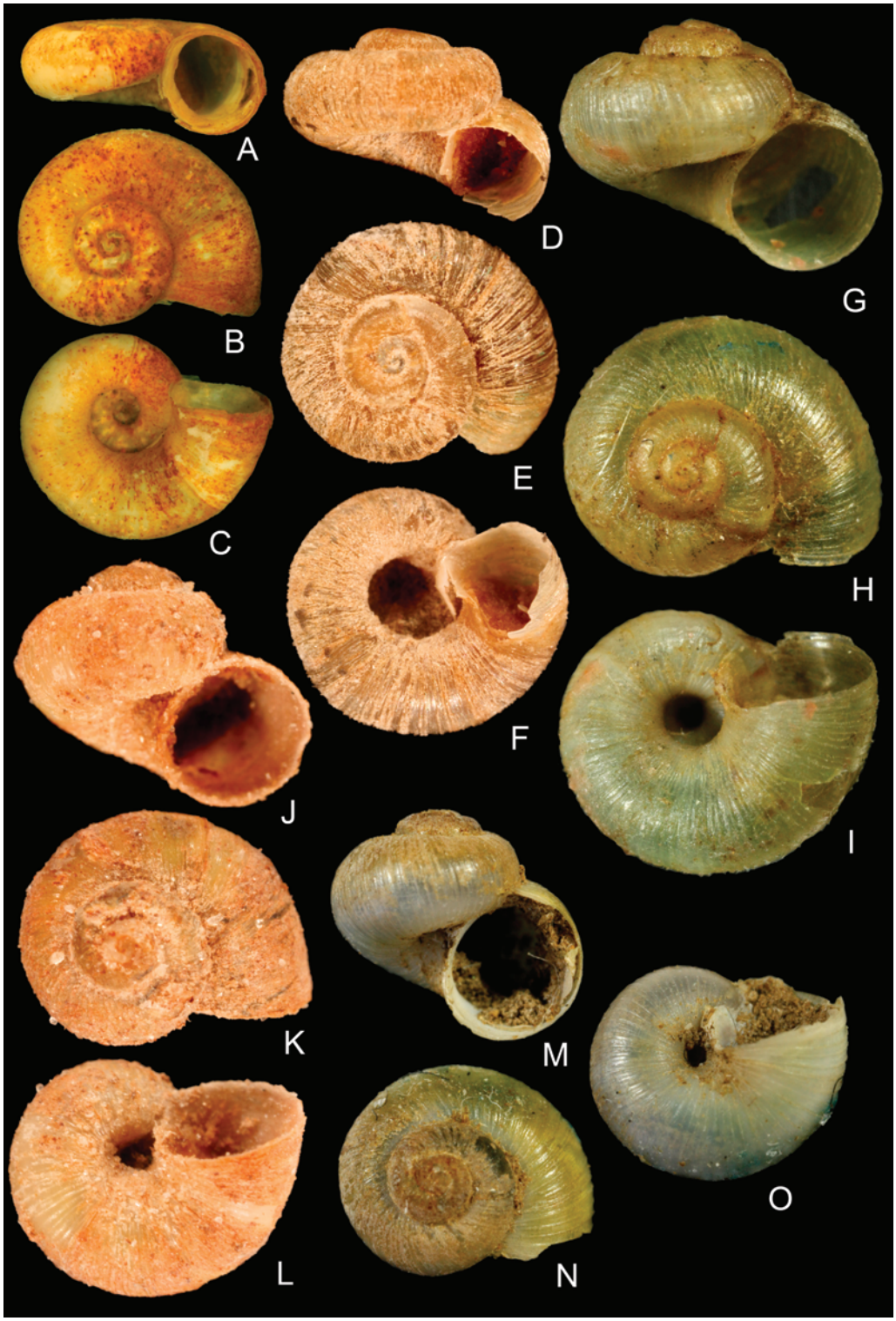

Fig. 5. A–C – *Cincinna kamchatica*, holotype, H = 2.4 mm; D–F – *Ciincinna chereshnevi*, holotype, H = 4.0 mm; G–I – *Cincinna chishimana*, holotype, H = 5.1 mm; J–L – *Cincinna sirotskii*, holotype, H = 4.5 mm; M–O – *Cincinna sirotskii*, paratype No. 3, H = 3.8 mm.

24. *Cincinna sirotskii* Starobogatov et Zatrawkin, 1985
(Fig. 5J–O)

History of the name application.

Starobogatov and Zatrawkin 1985: 1157, fig. 2 (description as *C.* (*Sibirovalvata*), section *Alienella*, key to identification, findings);

Bogatov and Zatrawkin 1990 (1992) (description, key to identification, distribution in Lower Amur basin);

Prozorova 1991a (mentioned for basins of rivers entering southern part of Japan Sea);

Prozorova 1991b (1992) (egg-clusters morphology from Razdolnaya River near Razdolnoye settlement);

Prozorova and Starobogatov, 1998b (shell drawing, key to identification, records from Middle and Lower Amur River basin, basins of Ussuri and Tugur rivers);

Prozorova and Kolpakov, 2004 (mentioned for southern part of Central Primorye zoogeographical province);

Prozorova et al. 2004 (records from Sladkoye and Erri lakes, Sakhalin Island, channel of Langra River, Amur Bay);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Potikha et al. 2008 (record from Lake Golubichnoye, Sikhote-Alin Reserve);

Prozorova 2013a, b (mentioned for malacofauna of southern continental waterbodies of Russian Far East);

Haszprunar 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Sibirovalvata*), information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Near Novyi Mir settlement, Komsomolsk District, Khabarovsk Territory (Far East), depth 0.2 m.

Types. Holotype (in alcohol): No. 1; paratypes: 60 spms in alcohol from type locality (coll. M. Zatrawkin, 1980): No. 2; 1 shell from Udyl Lake, Ulchsky District, Khabarovsk Territory: No. 3 (coll. M. Zatrawkin, 1980) and 6 spms in alcohol from Tugur River (coll. M. Zatrawkin, 1980): No. 4.

Additional records. Absent in ZIN collection. Razdolnaya River (Prozorova 1991b (1992), lakes of Sakhalin Island, channel of Langra River, Amur Bay (Prozorova et al. 2004); Lake Golubichnoye, Sikhote-Alin Reserve (Potikha et al. 2008).

Ecology. Lives in lakes and slowly flowing rivers (Prozorova and Starobogatov 1998b).

25. *Cincinna klucharevae* Starobogatov in Starobogatov et Zatrawkin, 1985
(Fig. 6A–C)

History of the name application.

Starobogatov and Zatrawkin 1985: 1158, fig. 5 (description);

Bogatov and Zatrawkin 1990 (1992) (description as *C.* (*Sirovalvata*), section *Alienella*, information about types, type locality, ecology and distribution);

Prozorova and Starobogatov, 1998b (shell drawing, key to identification, records from lakes of Sakhalin Island, Japan islands – Hokkaido and Honshu);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Haszprunar 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Sibirovalvata*), information about types, type locality, distribution, 'bionomics').

Type locality. Southern Sakhalin Island, near Bousset lagoon, Bolshoye Vavayeskoye Lake, depth 2.4 m.

Types. Lost.

Additional records. Absent in ZIN collection.

Ecology. Lives in waterbodies of Sakhalin together with *C. japonica* (Martens, 1877) (Prozorova and Starobogatov 1998b).

26. *Cincinna tymiensis* Starobogatov in Starobogatov et Zatrawkin, 1985
(Fig. 6D–F)

History of the name application.

Starobogatov and Zatrawkin 1985: 1157, fig. 3 (description, key to identification);

Bogatov and Zatrawkin 1990 (1992) (description as *C.* (*Sirovalvata*), section *Alienella*, information about types, type locality, ecology and distribution);

Prozorova and Starobogatov 1998b (shell drawing, key to identification, mentioned for rivers of Tym River basin, Sakhalin Island);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Haszprunar 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Sibirovalvata*), information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Sakhalin Island, right bank of the Tym River near Nogliki settlement.

Types. Holotype (in alcohol, dried): No. 1; 25 paratypes in alcohol from type locality (coll. A. Kafanov, 1978).

Additional records. Absent in ZIN collection.

Ecology. Collected from bottom sediments of coastal areas (Starobogatov and Zatrawkin 1985).

27. *Pseudomegalovalvata laethmophila* (Beckman et Starobogatov, 1975)

(Fig. 6G–I)

History of the name application.

Beckman and Starobogatov, 1975: 95, fig. 1D (д) (description as *Valvata* (*Pseudomegalovalvata*));

Sitnikova 1994 (key to identification);

Sitnikova and Shimaraev 2001 (mentioned as a "dwarf" of deep-water Baikal malacofauna);

Röpstorf and Riedel 2004 (mentioned as a member of deep-water Baikal malacofauna);

Sitnikova et al. 2004 (information about types, type locality and records);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Haszprunar 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Pseudomegalovalvata*), information about types, type locality, distribution, 'bionomics').

Type locality. Near Sytyi Cape, Listvennichnoye, Baikal Lake.

Types. Holotype (in alcohol): No. 1.

Additional records. No information.

Ecology. The only specimen was collected at the depth of 1380 m, on silty bottom (Beckman and Starobogatov 1975).

28. *Pseudomegalovalvata olkhonica* (Beckman et Starobogatov, 1975)

(Fig. 6J–L)

History of the name application.

Beckman, Starobogatov, 1975: 94, fig. 1B (б) (description as *Valvata* (*Pseudomegalovalvata*));

Sitnikova, 1994 (key to identification);

Sitnikova et al., 2004 (information about types, type locality and records);

Kantor, Sysoev, 2005; Kantor et al., 2010 (information about types, type locality and general distribution);

Haszprunar, 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Pseudomegalovalvata*), information about types, type locality, distribution, 'bionomics').

Type locality. Kharin-Irgi Bay (Olkhon Gate, Baikal Lake).

Types. Holotype (in alcohol): No. 1, depth 32–39 m.

Additional records. Shells similar to this species were found in Academic Ridge and near Birokan Cape in Lake Baikal.

Ecology. Collected from silted sand at depth from 32 to 290 m.

Distribution. Maloe More strait and Northern Baikal.

29. *Pseudomegalovalvata tenagobia* (Beckman et Starobogatov, 1975)

(Fig. 6M–O)

History of the name application.

Beckman and Starobogatov 1975: 93, fig. 1A (description as *Valvata* (*Pseudomegalovalvata*));

Sitnikova 1994 (key to identification);

Sitnikova et al. 2004 (information about types, type locality and records);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Haszprunar 2014 (information about types, type locality, original sources);

Vinarski and Kantor 2016 (as *Valvata* (*Pseudomegalovalvata*), information about types, type locality, distribution, 'bionomics').

Type locality. Kharin-Irgi Bay (Small Olkhon Gate, Baikal Lake).

Types. Holotype (in alcohol): No. 1; 15 paratypes in alcohol from type locality (coll. Ya. Starobogatov, expedition of Biological-Geographic Research Institute of Irkutsk State University, 1966): No. 2.

Additional records. Boguchanskaya Bay and near Boguchan Island, north-western littoral of Baikal (coll. A. Korotnev expedition, 1901); initial identification by Lindholm – *Valvata* (?*Cincinna*) *bathybia* Dybowski, 1888, reidentified by Ya. Starobogatov.

Ecology. The types were collected with a dredge, at the depth of 32–39 m, on muddy sand. A very rare species in Maloe More, on soft bottom with vegetative detritus, sometimes with admixture of gravel, at depth of 20–50 m.

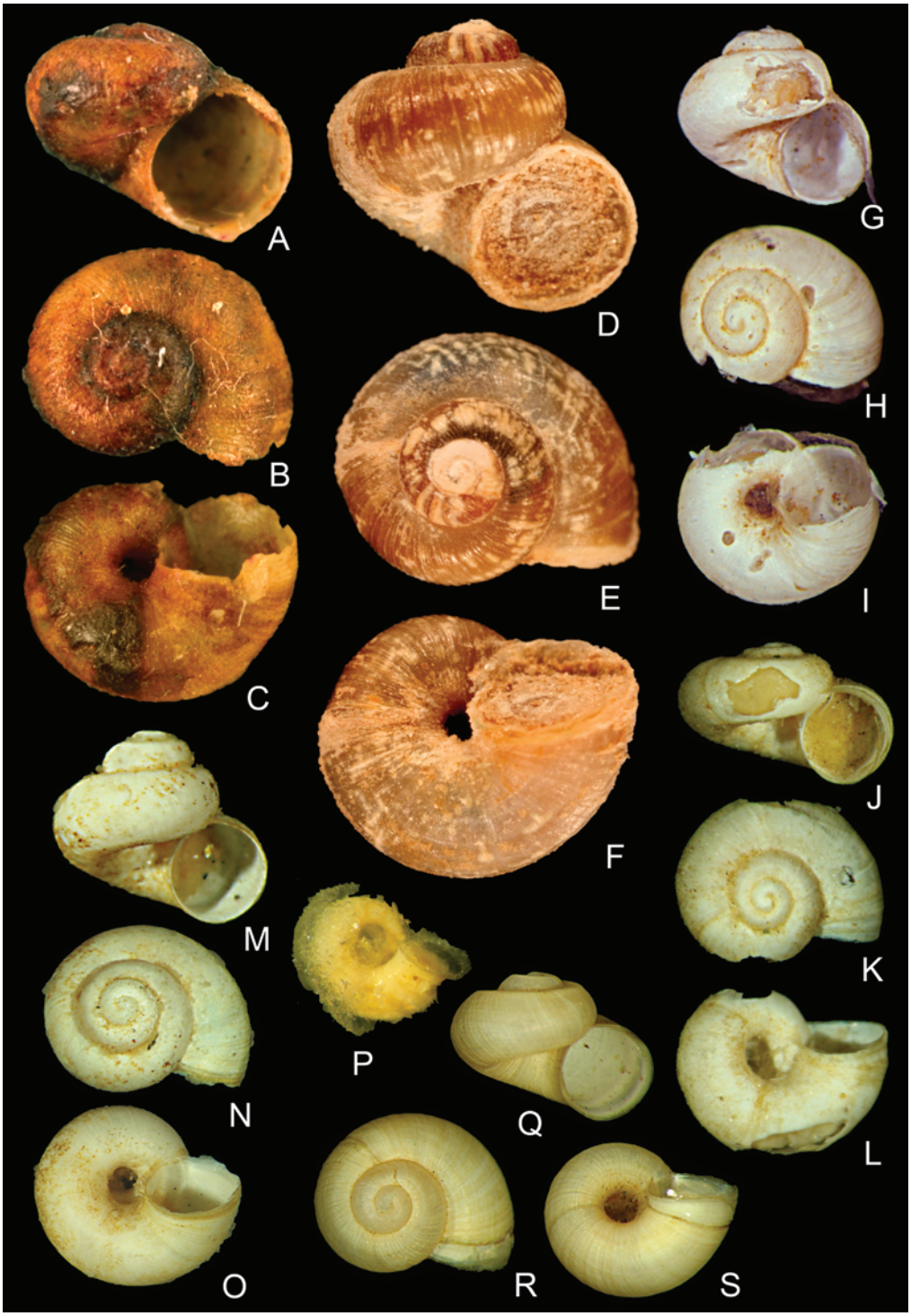

Fig. 6. A–C – *Cincinna klucharevae*, topotype, South Sakhalin, Tonino-Anivski peninsula, Bolshoe Vavayskoe Lake, coll., det. Prozorova; H = 3.3. mm; D–F – *Cincinna tymiensis*, holotype, H = 5.6 mm; G–I – *Pseudomegalovalvata laethmophila*, holotype, H = 2.0 mm; J–L – *Pseudomegalovalvata olkhonica*, holotype, H = 2.0 mm; M–O – *Pseudomegalovalvata tenagobia*, holotype, H = 2.9 mm; P – *Pseudomegalovalvata profundicola*, holotype, W = 2.6 mm (H = 1.7 mm); Q–S – *Pseudomegalovalvata profundicola*, paratype No.2, W = 2.4 mm.

30. *Pseudomegalovalvata profundicola* (Beckman et Starobogatov, 1975)
(Fig. 6P–S)

History of the name application.
Beckman and Starobogatov 1975: 95, fig. 1G (r) (description as *Valvata* (*Pseudomegalovalvata*));
Sitnikova 1994 (shell drawing of holotype, key to identification);
Sitnikova et al. 1993 (record from Frolikha hydrothermal vent);
Sitnikova and Shimaraev 2001 (deep-water dweller of Baikal Lake);
Roepstorf and Riedel 2004 (mentioned as a member of deep-water Baikal malacofauna, protoconch and radular teeth morphology);
Sitnikova et al. 2004 (information about types, type locality and findings);
Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);
Haszprunar 2014 (information about types, type locality, original source);
Vinarski and Kantor 2016 (as *Valvata* (*Pseudomegalovalvata*), information about types, type locality, distribution, 'bionomics').

Type locality. Near Bolsodei Cape, Northern Baikal Lake.

Types. Holotype (in alcohol): No. 1; paratypes: 29 in alcohol and 6 dry from type locality: No. 2.

Additional records. Sosnovskaya Bank (col. M. Beckman, det. Ya. Starobogatov) (ZIN), Frolikha Bay, Academic Ridge, Solontsovyi Cape (own data).

Ecology. Inhabits silty sand at the depth of 100–800 m.

CAENOGASTROPODA Cox, 1960

VIVIPAROIDEA Gray, 1847

Ya. I. Starobogatov (in Starobogatov et al. 2004) believed that the superfamily Viviparoidea should include 3 families of freshwater mollusks of the former USSR: Viviparidae Gray, 1847, Amuropaludinidae Kruglov et Pavlyuchenkova, 1995, and Bellamyidae Röhrbach, 1937. The first family (Viviparidae) unites two genera: *Viviparus* Montfort, 1810 and *Contectiana* Bourguignat, 1880, the former including species-level taxa conchologically similar to *V. viviparus* L., 1758, and the latter – to *V. contectus* Millet, 1813. *Contectiana ladogensis* described from Ladoga Lake was placed by Chernogorenko and Starobogatov (1987) in the subgenus *Kobeltipaludina* Chernogorenko et Starobogatov, 1987. The second species described by these authors, *Viviparus graecus*, was placed in the subgenus *Balkanipaludina* Starobogatov 1985 (1986). Snails identified as these species have never been subsequently found in any locality. However, *Contectiana ladogensis* has been repeatedly mentioned in Red Books of Leningrad Province and in catalogs and guides to identification of mollusks of Russia (Kantor et al. 2010; Kijashko et al. 2016). According to current European classification (Bouchet et al. 2005), both species are included in the genus *Viviparus*. According to Starobogatov et al. (2004), in the malacofauna of Russian Far East the family Amuropaludinidae includes genus *Amuropaludina* Moskvicheva, 1979; and family Bellamyidae contains genus *Cipangopaludina* Hannibal, 1912, single species of which was described by Starobogatov in Moskvicheva, 1979. In the Bouchet et al. (2005) classification, the family Amuropaludinidae (with genus *Amuropaludina* Moskvicheva, 1979) is considered as a synonym of the subfamily Bellamyinae of Viviparidae.

VIVIPARIDAE Gray, 1847

VIVIPARINAE Gray, 1847

31. *Viviparus graecus* Chernogorenko et Starobogatov, 1987
(Fig. 7A–B)

History of the name application.
Chernogorenko and Starobogatov, 1987a: 146 (shell description as *V.* (*Balkanipaludina*), type locality, possible distribution in northwestern Greece);
Chernogorenko 1988: 650, fig. 3z (3) (description as a new species, key to identification)
Chernogorenko 1992: 12, fig. 13h (description as a new species, table to determination).

Type locality. Goritsa, Greece.

Types. Holotype (dry): No. 1 (coll. C. Westerlund); paratype (mentioned by Chernogorenko, 1988) is lost.

Additional records. No data.

Ecology. No data.

Remarks. The name spelling of the author of this and the next species was given at the first mentioning (Chernogorenko and Starobogatov 1987) as Tshernogorenko, then as Tchernogorenko (Chernogorenko 1988), and only later (Chernogorenko 1992) as Chernogorenko.

32. *Viviparus ladogensis*
(Chernogorenko et Starobogatov, 1987)
(Fig. 7C–E)

History of the name application.
Chernogorenko and Starobogatov 1987a: 147 (as *Contectiana* (*Kobeltipaludina*));
Chernogorenko 1988: 653, Fig. 4Z (3) (description as a new species, key to identification);
Chernogorenko 1992: 12, fig. 14h (description as a new species, table to determination);
Starobogatov et al. 2004 (key to identification, general distribution);
Starobogatov 2002 (included in the Red Book of the Leningrad Province;
Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);
Anistratenko et al. 2014 (mentioned as *Contectiana*);
Kijashko et al. 2016 (as *Contectiana*, size and photo of the holotype, key to identification);
Vinarski and Kantor 2016 (as *V.* (*Contectiana*), information about types, type locality, distribution, 'bionomics'; as a synonym of *V. contectus* (Millet, 1813)).

Type locality. Northern part of Ladoga Lake (NW European Russia).

Types. Holotype (in alcohol), No. 1, and paratype (shell and body in alcohol) from type locality (coll. Ya. Starobogatov, 1983): No. 2.

Additional records. No data.

Ecology. No exact data.

BELLAMYINAE Rörbach, 1937

33. *Cipangopaludina kurilensis*
Starobogatov in Moskvicheva, 1979
(Fig. 7F–I)

History of the name application.
Starobogatov in Moskvicheva 1979: 91, Fig. 1 (description);
Bogatov and Zatrawkin 1990 (1992) (shell morphology, key to identification, distribution);
Prozorova 1997 (records from Kunashir, Iturup Islands and southern Sakhalin Island and Japan; synonymy: *Viviparus malleatus* Reeve, 1863 (Miyadi 1933, 1938; Shadin 1952; *Cipangopaludina malleata* (Kluchareva et al. 1969);
Prozorova 1998a (mentioned for South Kurile Islands, southern Sakhalin Island and Japan);
Starobogatov et al. 2004 (key to identification, general distribution);
Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);
Palatov 2014 (records from offshore areas of lagoon lakes in Kunashir Island);
Vinarski and Kantor 2016 (as *V.* (*Contectiana*), information about types, type locality, distribution, 'bionomics').

Type locality. Lake (Peschanoye?) near Furukamappu (= Yuzhno-Kurilsk), Kunashir Island (Kurile Islands).

Types. Lectotype, female (dry shell and body in alcohol), No. 1. (coll. K. Yudin, 1948, initial identification by Shadin – *Vivipara malleata*, lectotype designated by Zatrawkin and Bogatov (1990) (1992)).

Additional records. Primary identifications as *Vivipara malleata* (reidentified by Starobogatov): Kurile Islands, Iturup Island, freshwater lake in 1.5 km from coast (coll. O.I. Kussakin, 1954); Yokohama (coll. Schrenck, Martens); Kunashir Island, Peschanoye Lake (coll. O. Kluchareva, 1963); Iturup Island, lake No. 3 (= Mushyu = Anikutan = Onekatan) (coll. N. Zarenkov, 1956); Kunashir Island, Tretyakovo, Peschanoye Lake (coll. M. Meier, 1968); Sakhalin Island, Tym River, at Kotik (coll. A. Taranets, 1934); Sakhalin Island, brook connecting lake at Kotik with Tym River (coll. A. Taranets, 1934); lake of Tym River basin, at Kotik (coll. A. Taranets, Chekmarev, 1934); Kurile Islands, Iturup Island, Blagodatnoye Lake, at shore line (coll. S. Popova, 1980); Sakhalin Island, Kholmsky District (coll. A. Basarukin, 1985) (ZIN).

Ecology. The snails were collected on mud shallows with water vegetation (label data).

TRUNCATELLOIDEA Gray, 1840

AMNICOLIDAE Tryon, 1863

AMNICOLINAE Tryon, 1863

Family Kolhymamnicolidae was created by Starobogatov, 1983 for two genera *Akiyoshia* Kuroda et Habe, 1954 (1 sp) and *Kolhymamnicola* Starobogatov et Budnikova, 1976 (4 spp) distributed in Russian Far East waterbodies. At present both genera are considered within the subfamily Amnicolinae (of Amnicolidae family) (Bouchet 2015; Vinarski and Kantor 2016). Family Baicaliidae Fisher, 1885 has also been attributed to Amnicolidae at the subfamilial taxonomic level (Bouchet et al. 2005), but here we considered baicaliids as a separate family.

34. *Kolhymamnicola kolhymensis* (Starobogatov et Streletzkaja, 1967)

(Fig. 7J–L)

History of the name application.

Starobogatov and Streletzkaja 1967: 228–229, fig. 12 (description as *Amnicola kolhymensis*);

Levanidova and Levanidov 1972 (distribution in Ajabachie Lake);

Kurenkov 1967 (record from Ajabachie Lake);

Bogatov and Sirotski 1978 (as *Kolhymamnicola,* records from floodplain lakes of Upper Zeya River, habitat, age, growth, production);

Starobogatov and Budnikova 1976 (record from Ajabachie Lake, Bol'shoe Ueginskoe and Rybnoe lakes, lake No 5 of Anadyr region, middle flow of Amguni River (Amur River basin));

Butorina 1987 (trematode invasion 7.1% in Ajabachie Lake; first intermediate host of stylet cercaria *Xiphidiocercaria* sp. – 4.2%; and main additional host of metacercaria – 5.6% invasion in snails);

Prozorova 1986 (record from Kolyma River basin, basins of rivers entering Krest Bay, Anadyr, Eastern Kamchatka);

Zatrawkin and Bogatov 1988 (key to identification, distribution);

Prozorova 1998a (distribution);

Dolgin 2001 (distribution in Lower Lena River);

Prozorova and Shed'ko 2003 (distribution in Ajabachie and Dyakonovskoye lakes);

Starobogatov et al. 2004 (key to identification, distribution);

Prozorova et al. 2004 (record from Sakhalin Island);

Prozorova 2005 (record from Tauysk Bay);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Dolgin 2009 (mentioned for Lena and Yano-Kolyma zoogeographical provinces in Siberia);

Sitnikova et al. 2010 (distribution, sites of locations, sister group to Baicaliidae);

Dolgin 2012 (mentioned for Tuva waterbodies);

Prozorova 2013a, b (mentioned for malacofauna of southern continental waterbodies of Russian Far East);

Dolgin, 2013 (mentioned for foothills and lowland of Sayan mountain system);

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Kudinskie lakes of Lower Kolyma River floodplain, near the small settlement Karetovo (near Cherski settlement).

Types. Holotype (in alcohol): No. 1 and 21 paratypes (7 alcohol + 14 dry, all coll. by Kolyma Ichthyological Expedition, E. Streletzkaja, 1963): Nos. 2–11 from watershed of Kolyma – lakes Pravoe (No. 2) and Levoe Topolskoe (No. 3); Kapanskie lakes (Nos. 4–6), Proryv lake, Upper Karetovskaya channel (Nos. 7, 8), lakes on the shore of Amyvinskaya (No. 9) and Topolskaya (No. 10) channels, Lower Kolyma region (No. 11).

Additional records. Ajabachie Lake, Kamchatka (coll. I. Levanidova, det. I. Moskvicheva); Lake 5, Anadyr district, Chukchi Peninsula (coll. E. Streletzkaja, det. L. Budnikova, Ya. Starobogatov); Lake 6, Anadyr District, Chukchi Peninsula (coll. E. Streletzkaja, det. Z. Izzatulaev); small waterbody near Noma city, Alaska (coll. B. Sirenko, det. L. Prozorova) (ZIN). We also cite here the published data on this species (Sitnikova et al. 2010) concerning collection material stored in Biological-Soil Institute of Far-Eastern Division of Russian Academy of Sciences (Vladivostok): Lower Kolyma, Cherski settlement (coll. K. Regel, det. L. Prozorova); from unnamed thermokarst lake floodplain, Middle Kolyma River basin near boundary of Magadan National Park (coll. K. Regel, det. L. Prozorova); Priyatnoye Lake, Middle Kolyma River basin (coll. K. Regel, det. L. Prozorova); unnamed lake in vicinities of Anadyr City, Avtotkul River basin (coll. K. Regel, det. L. Prozorova); Turpanka Lake, vicinities of Petropavlovsk-Kamchatskiy city (coll. V. Kavun, det. L. Prozorova); unnamed lake at Yamskaya inlet of Okhotsk Sea coast (coll. A. Chudnov, det. L. Prozorova); unnamed lake in Perevolochnaya River valley at Yamskaya inlet (coll. V. Andreev, det. L. Prozorova); Tynerynda Lake in Yama River valley (coll. V. Andreev, det. L. Prozorova).

Ecology. Lives in floodland and floodland-thermokarst waterbodies, on water vegetation (Bogatov and Zatrawkin 1990 (1992)). In lakes of the Upper Zeya, the snails prevail in relatively deep water in macrophyte thickets in offshore zone (down to 0.6 m), where in August the species density exceeds 1900 spm/m^2 and the biomass reaches 4 g/m^2. On brown mud with vegetative vestiges down to 2 m, the species was found sporadically (Bogatov and Sirotski 1978). In Ajabachie Lake, the snails were numerous in Timofeevsky Bay, in littoral overgrown with macrophytes; they also were recorded in the sublittoral (Prozorova and Shed'ko 2003).

Bogatov and Sirotski (1978) studied the body mass of snails with shell of III and IV age groups (3.1–3.4 and 4.0–4.5 mg, respectively), defined correlation coefficient between the shell width and the snail weight, the shell growth parameters, and re-

vealed that at constant temperature (17 °C) the snails reach the maximum shell size during 400–500 days after hatching; vegetation period lasts 130–140 days, the life span is 3 years, and there are two generations a year. The species was found in co-occurrence with *K. miyadi* (Turpanka Lake) and *K. ochotica* (Tynerynda Lake).

35. *Pyrgobaicalia aenigma* Starobogatov, 1972
(Fig. 7M–O)

History of the name application.
Starobogatov 1972a: 169–170, fig. 6 (description);
Sitnikova 1994 (mentioned as a member of Baicaliidae);
Starobogatov et al. 2004 (key to identification, general distribution);
Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);
Izzatulaev et al. 2010 (mentioned as creophyle);
Vinarski and Kantor 2016 (information about types, type locality, distribution).

Type locality. Tajik SSR, Gorno-Badakhshan Autonomous Region, Dunkulduk Lake (probably carried out from a nearby spring).

Types. Holotype (dry): No. 1, and paratype (dry): No. 2 – from type locality.

Additional records. No data.

Ecology. No data.

Remarks. The species assignement to the family Amnicolidae is only conditional. Besides, we consider unjustified a suggestion of any relationship of this species with baicaliids, as it was suggested earlier (Sitnikova 1994).

BAICALIIDAE FISHER, 1885

36. *Teratobaikalia clandestina* (Beckman et Starobogatov, 1975)
(Fig. 7P)

History of the name application.
Beckman and Starobogatov 1975: 97, fig. 2A (description as *Baicalia* (*Baicaliella*));
Sitnikova 1990 (1991) (as *Teratobaikalia* (*Baikaliella*));
Sitnikova et al. 2001 (protoconch morphology, records from Maloe More Straight, Chivyrkui and Barguzin bays in Baikal Lake);
Sitnikova et al. 2004 (information about types, type locality);
Kantor and Sysoev 2005; Kantor et al. 2009 (2010) (information about types, type locality and general distribution);
Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Slyudyanka (Southern Baikal) at depth of 240 m (bottom type not mentioned).

Types. Holotype (dry): No.1.

Additional records. Specimens identified as *T.* cf. *clandestina* were found in Maloe More strait, Chivyrkui and Barguzin bays of Baikal.

Ecology. The snails were found on sandy bottom with admixture of gravel and vegetative detritus, at 13–30 m depth, together with related species *T. humerosa* and *T. nana*.

Remarks. The shell is similar to *T. producta* (Kozhov 1936).

37. *Teratobaikalia humerosa* (Beckman et Starobogatov, 1975)
(Fig. 7Q–S)

History of the name application.
Beckman and Starobogatov 1975: 97, fig. 2A (description as *Baicalia* (*Baicaliella*));
Sitnikova 1990 (1991) (as *Teratobaikalia* (*Baikaliella*));
Sitnikova et al. 2001 (protoconch morphology, records from Barguzin Bay in Baikal Lake);
Sitnikova et al. 2004 (information about types, type locality, record from Chivyrkui Bay);
Kantor and Sysoev 2005; Kantor et al. 2009 (2010) (information about types, type locality and general distribution);
Vinarski and Kantor 2016 (information about types, type locality, distribution, 'bionomics').

Type locality. Near Yazovka River (north-western Baikal).

Types. Holotype (dry): No.1, 5 paratypes from type locality : No. 2.

Additional records. Maloe More, Chivyrkui and Barguzin bays of Baikal.

Ecology. Lives on sandy bottom with admixture of gravel and vegetative detritus, at 13–50 m depth. Dissected snails from Maloe More and Chivyrkui Bay showed a trematode invasion, while other endemic gastropods usually lack trematodes (own data).

BITHYNIIDAE Gray, 1857

The family Bithyniidae in Russian scientific literature (Starobogaov et al., 2004) includes two subfamilies: Bithyniinae and Mysorellinae Annandale, 1920, the first includes 5 genera: *Codiella* Monterosato in Locard, 1884 (2 spp), *Digyrcidum* Locard, 1882

(1 sp); *Bithynia* Leach in Abele, 1818 (2 subgenera with 4 spp), *Opisthorchophorus* Beriozkina, Levina et Starobogatov in Anistratenko et Stadnichenko 1994 (5 spp), and *Paraelona* Beriozkina, Levina et Starobogatov in Anistratenko et Stadnichenko 1994 (5 spp). The second subfamily includes 4 genera: *Digoniostoma* Annandale, 1920 (2 spp), *Alocinma* Annandale et Prashad, 1919 (1 sp.), *Parafossarulus* Annandale, 1924 (3 spp) and *Boreoelona* Starobogatov et Streletzkaja, 1967 (7 spp). Of these, Starobogatov with coauthors described 8 species; besides, a species of the East African genus *Gabbiella* Mandahl-Barth, 1968 was described from waterbodies of Azerbaijan. This genus was previously assigned to the subfamily Parafossarulinae Starobogatov in Starobogatov et Sitnikova, 1983 of the family Bithyniidae. The system of the family suggested by Starobogatov was not supported by other malacologists and was criticized (e.g. Bouchet et al. 2005; Pershko 2010; Kijashko et al. 2016; Vinarski and Kantor 2016). Having studied the collection of the ZIN RAS and our collections, we concluded that it is reasonable to use the genus *Bithynia*, with subgenera *Bithynia* s. str. (including species of *B. tentaculata* L., 1758 group) and *Codiella* (species of *B. leachi* (Sheppard, 1823) group), similarly to the situation adopted by Western researchers (e.g. Glöer 2002). Besides, and based on scarce molecular-phylogenetic data (Romanov et al. 2010), we retain *Boreolona* as a subgenus (species of *B. contortrix* Lindholm, 1909 group and *B. ussuriensis* Buttner et Ehrmann, 1927). The genera *Opisthorchophorus* and *Paraelona* we consider as synonyms of *Bithynia*. Below, we give information about 8 bithyniid species described by Starobogatov with coauthors without subdivision into subgenera. However, we temporarily retain *Parafossarulus* and *Gabbiella* in the genus status.

38. *Bithynia abakumovae* (Andreeva et Starobogatov, 2001)

(Fig. 7T–U)

History of the name application.

Andreeva and Starobogatov 2001: 77–78, fig. 1 (description as *Opisthorchophorus*, shell measurements, comparison with *Bithynia troscheli*; records);

Dolgin and Novikov 2004 (as *Opisthorchophorus*, mention as possible intermediate of opisthorchid trematodes);

Starobogatov et al. 2004 (as *Opisthorchophorus,* key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (as *Opisthorchophorus,* information about types, type locality and general distribution);

Andreeva et al. 2005 (records from Krivoye Lake and Atachka River, Middle Irtysh basin);

Andreeva et al. 2006 (as *Opisthorchophorus,* mentioned for Irtysh drainage basin);

Vinarski et al. 2007 (2008) (as *Opisthorchophorus,* record from Irtysh and Lower Ob zoogeographical province in Western Siberia);

Dolgin 2009 (as *Opisthorchophorus,* mentioned for Irtysh zoogeographical province in Siberia);

Lazutkina et al. 2012a (as *Opisthorchophorus,* records from Zharkol and Bezymyannoye lakes, North Kazakhstan);

Lazutkina et al. 2012b (as *Opisthorchophorus,* copulatory organ morphology);

Lazutkina et al. 2012c (as rare species in waterbodies of South-Western Siberia);

Dolgin and Maslennikov 2015 (as *Opisthorchophorus,* record from Chulym River, middle Ob River basin);

Vinarski and Kantor 2016 (as *B.* (*Opisthorchophorus*), information about types, type locality with coordinates, distribution, 'bionomics')).

Type locality. Western coast of Krivoye Lake, Tara District of Omsk Province (Western Siberia).

Types. Holotype (dry): No. 1, and 5 dry paratypes from type locality: No. 2.

Additional records. Absent in ZIN collection.

Ecology. Temporary and semipermanent waterbodies (Starobogatov et al. 2004).

39. *Bithynia valvatoides* (Beriozkina et Starobogatov in Beriozkina, Levina et Starobogatov, 1995)

(Fig. 8A–B)

History of the name application.

Beriozkina et al. 1995: 34–35, figs. 1I, 4F (description as *Opisthorchophorus,* key to identification);

Anistratenko and Stadnichenko 1994: 148, fig. 126 (short description as *Opisthorchophorus*, key to identification);

Anistratenko 1998 (as *Opisthorchophorus*, key to identification, short description, distribution);

Gradowski 2001a (as *Opisthorchophorus*, records from lower reaches of Dnieper and South Bug, ecology);

Son 2002 (temporary waterbodies of Odessa Region);

Starobogatov et al. 2004 (as *Opisthorchophorus*, key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (as *Opisthorchophorus*, information about types, type locality and general distribution);

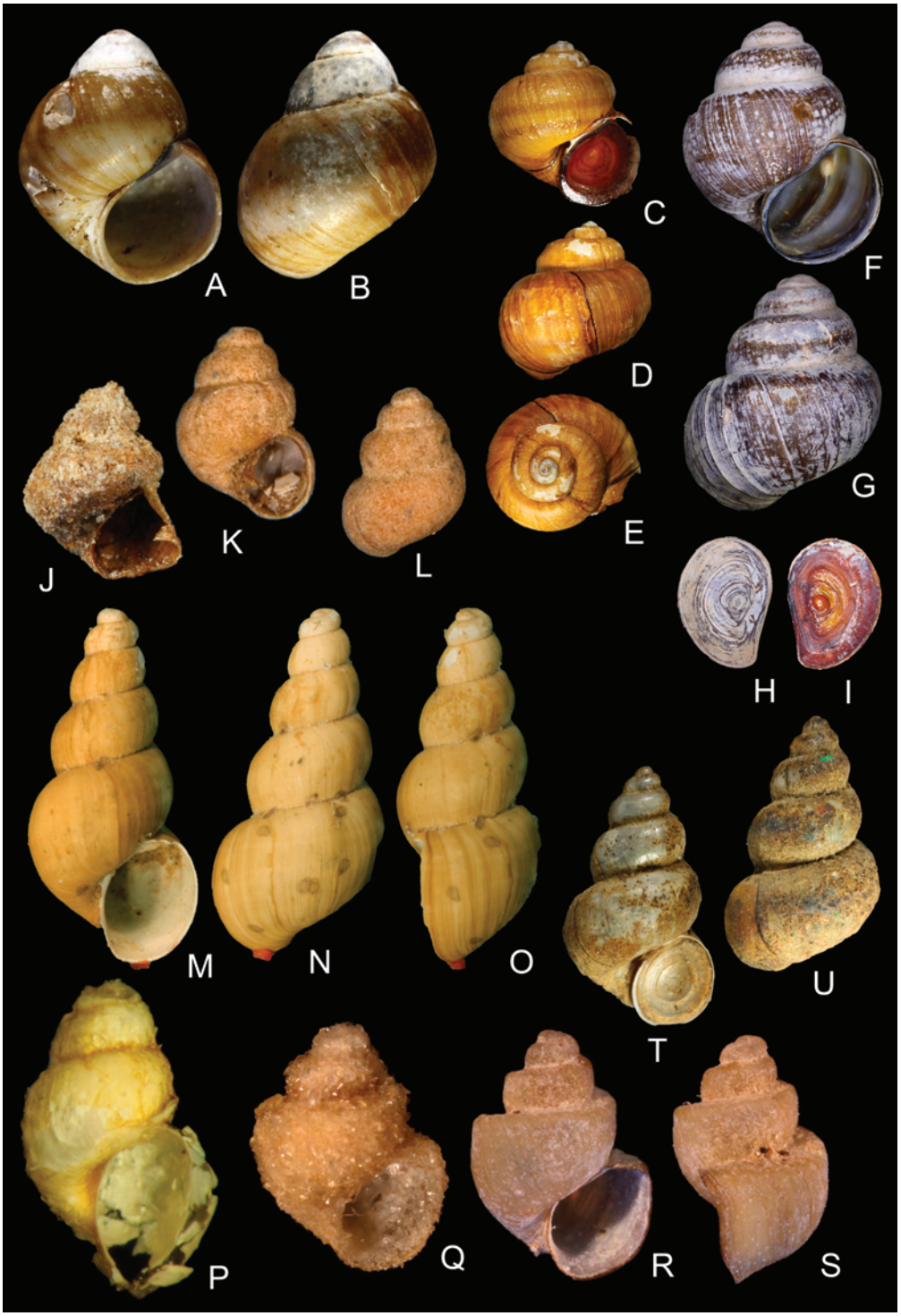

Fig. 7. A–B – *Viviparus graecus*, holotype, H = 23.2 mm; C–E – *Viviparus ladogensis*, holotype, H = 30.1 mm; F–I – *Cipangopaludina kurilensis*, lectotype, H = 52.8 mm; J – *Kolhymamnicola kolhymensis*, holotype, H = 2.8 mm; K–L – *Kolhymamnicola kolhymensis*, paratype No. 4, H = 3.2 mm; M–O – *Pyrgobaicalia aenigma*, holotype, H = 5.9 mm; P – *Teratobaikalia clandestina*, holotype, H = 3.3 mm; Q – *Teratobaikalia humerosa*, holotype, H = 3.8 mm; R–S – *Teratobaikalia humerosa* from Maloe More strait (Baikal), H = 3.6 mm; T–U – *Bithynia abakumovae*, holotype, H = 10.7 mm.

Andreeva et al. 2006 (mentioned as *Opisthorchophorus*);
Dolgin and Maslennikov 2015 (as *Opisthorchophorus*, record from Chulym River, middle Ob River basin);
Kijashko et al. 2016 (as a synonym *of Opisthorchophorus troschelii* (Paasch, 1842));
Vinarski and Kantor 2016 (as *B.* (*Opisthorchophorus*), information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Sergievka, Balashov District, Saratov Province.

Types. Holotype (dry): No. 1 (coll. A. Silantiev, 1890, initial identification by Westerlund as *B. leachi*); 13 paratypes (dry): No. 2 – Stavropol Territory, shore of Manych-Gudilo Lake (coll. W. Faussek, 1902).

Additional records. No. 3 (3 shells) from Stavropol Territory, Yegorlyk River mouth near the Lake Gudilo (now it is the water area of the Proletarskoye Reservoir) (coll. V. Faussek, initial identification by Lindholm as *B. leachi*, then reidentified by Ya. Starobogatov); No. 4 (2 shells) – Mari El Republic, Pokiyer Lake (coll. P. Bedov, det. P. Kijashko) (ZIN).

Ecology. Inhabits temporary waterbodies (Starobogatov et al. 2004).

40. *Bithynia fausseki* (Beriozkina et Starobogatov in Anistratenko et Stadnichenko, 1994)
(Fig. 8C–D)

History of the name application.
Anistratenko and Stadnichenko 1994: 152, 153, fig. 130 (description as *Paraelona fausseki*, shell measurements, differential diagnosis, ecology);
Anistratenko 1998 (as *Paraelona,* key to identification, short description, distribution);
Starobogatov et al. 2004 (as *Paraelona,* key to identification, general distribution);
Kantor and Sysoev 2005; Kantor et al. 2010 (as *Paraelona,* information about types, type locality and general distribution);
Dementev 2015 (as *Paraelona,* mentioned for Central Ciscaucasia);
Kijashko et al. 2016 (mentioned as a possible synonym of *Opisthorchophorus troschelii*);
Vinarski and Kantor 2016 (as *B.* (*Paraelona*), information about types, type locality, distribution, 'bionomics')).

Type locality. Channel from Bolshoy Yegorlyk to Gudilo Lake, Rostov Province, Russia.

Types. Holotype (dry) from No. 20 of *B. leachi* – det. W. Lindholm, coll. W. Faussek.

Additional records. No exact data.

Ecology. In temporary waterbodies (Anistratenko 1998).

41. *Bithynia milachevitchi* (Beriozkina et Starobogatov, 1995)
(Fig. 8E–F)

History of the name application.
Anistratenko and Stadnichenko 1994 (1995): 151, 152, fig. 129 (description by Beriozkina et Starobogatov as *Paraelona*);
Anistratenko 1998 (key to identification, short description, distribution);
Starobogatov et al. 2004 (key to identification, general distribution);
Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);
Andreeva and Abakumova 2003 (records from West Siberia and Northern Kazakhstan);
Andreeva et al. 2005 (record for Vologodskaya channel and Bezymyannaya River, lower reaches of Ob River);
Vinarski et al. 2007 (2008) (record from Lower Ob zoogeographical province in Western Siberia);
Dolgin 2009 (mentioned for Lower Ob zoogeographical province in Siberia);
Lazutkina et al. 2012b (copulatory organ morphology);
Dementev 2015 (mentioned for Central Ciscaucasia);
Kijashko et al. 2016 (partly as a synonym of *Codiella leachii* and *Opisthorchophorus troschelii*);
Vinarski and Kantor 2016 (as *B.* (*Paraelona*), information about types, type locality, distribution, 'bionomics')).

Type locality. Konka River (one of channels in the Dnieper delta), near Balki village, Kherson Province, Ukraine.

Types. Holotype (dry): No. 2; paratypes: 2 shells (No. 1) – lower reaches of Ob River, Vologodskaya channel (coll. V. Dolgin, 1972); and 1 shell (No. 3) eastern Black Sea (unknown collector, 1909).

Additional records. Absent in ZIN collection. Waterbodies of Lower Ob, Khanty-Mansi Autonomous Region: Vologodskaya channel, Bezymyannaya River, right tributary of the Ob, Chukreevskoye Lake, left bank of Gromych channel (Andreeva and Abakumova 2003).

Ecology. Lives in rivers (Starobogatov et al. 2004).

42. *Bithynia ehrmanni* (Prozorova et Starobogatov, 1991)
(Fig. 8G–J)

History of the name application.
Prozorova and Starobogatov 1991: 137, fig. 1 (description as *Boreoelona*);
Prozorova 1991a (mentioned for basins of rivers entering the southern part of the Japan Sea; Khanka Lake and Ussuri River basins);

Prozorova 1992 (records from semipermanent and permanent small waterbodies of Primorye Territory);

Prozorova 2000 (mentioned for rivers of Amur River basin and rivers entering the Japan Sea);

Prozorova 2001 (records from Amur and Lyaoche basins);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Zasypkina 2008 (records from Ingoda, Gorchaki and Tugda rivers of Upper Amur River basin);

Prozorova 2013a, b (mentioned for malacofauna of southern continental waterbodies of Russian Far East);

Vinarski and Kantor 2016 (as *Boreoelona*, information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Lake near railway station Khabarovsk-2, Khabarovsk Territory.

Types. Holotype (♀, in alcohol): No. 1; allotype (♂, in alcohol): No. 2; 11 paratypes (in alcohol): No. 3 – from type locality (coll. I. Moskvicheva, 1972).

Additional records. Absent in ZIN.

Ecology. Lives in small permanent and semipermanent waterbodies, on bottom and on vegetation. In the Lower Tumannaya River basin it was found together with *Bithynia ussuriensis* Ehrmann in Buttner et Ehrmann, 1927 (Prozorova 2001).

43. *Bithynia lindholmiana* Starobogatov et Streletzkaja, 1967
(Fig. 8K–L)

History of the name application.

Starobogatov and Streletzkaja 1967: 227–228, fig. 11 (description as *Bithynia* (*Boreolona*));

Krivosheina and Starobogatov 1973 (as *Bithynia*, mentioned for mountain part of Upper Irtysh basin);

Starobogatov and Zatrawkin 1987 (as *Boreolona*);

Starobogatov et al. 2004 (as *Boreolona*, key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (as *Boreolona*, information about types, type locality and general distribution);

Lazutkina et al. 2012a (as *Boreolona*, mention for malacofauna of North Kazakhstan);

Vinarski and Kantor 2016 (as *Boreoelona*, information about types, type locality, distribution, 'bionomics').

Type locality. Semipalatinsk Province, waterbodies near the Lake Kos-Kul.

Types. Holotype (dry) No. 4; paratypes: 18 shells (No. 2) from type locality (here and then – coll. G. Polyakov, 1935); 2 shells (No. 2) – Chernyi Irtysh River, Kazakhstan; 7 shells (No. 3) – Zaisan Lake.

Additional records. Lake Zaisan and Irtysh River (east Kazachstan) (col., det. Yu. Belyakova, 1968) (ZIN).

Ecology. In lakes and backwaters of rivers (Starobogatov et al. 2004).

44. *Gabbiella cyrea* Starobogatov in Starobogatov et Zatrawkin, 1987
(Fig. 8M–N)

History of the name application.

Starobogatov and Zatrawkin 1987: 151 (description);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Soyukh-bulag River, Azerbaijan.

Types. Holotype (in alcohol): No. 1; 11 paratypes (in alcohol) from left tributary of Kura River, Gazakh District (coll. R. Aliev, 1985): No. 2.

Additional records. No data.

Ecology. No data.

45. *Parafossarulus spiridonovi* Zatrawkin et Starobogatov in Zatrawkin, Dovgalev et Starobogatov, 1989
(Fig. 8O–P)

History of the name application.

Zatrawkin et al. 1989: 77–78, fig. 3 (description, shell measurements for females and males, comparison with *P. manchouricus* and *P. sungariensis*)

Bogatov and Zatrawkin 1990 (1992) (description, information about types, distribution in Amur River basin)

Prozorova 2000 (record from Ilistaya River, Khanka Lake basin)

Starobogatov et al. 2004 (key to identification, general distribution)

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution)

Prozorova 2013a, b (mentioned for malacofauna of southern continental waterbodies of Russian Far East)

Prozorova et al. 2014b (shell photos, localities, ecology)

Vinarski and Kantor 2016 (information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Near village Kirovo, basin of Bidzhan River (Jewish Autonomous Province), Khabarovsk Territory.

Types. Holotype (in alcohol): No. 1, and 1 paratype (in alcohol) from type locality (coll. A. Dovgalev, 1981); other paratypes (all collected by A. Dovgalev, 1979–1986): 20 spec. in alcohol (No. 3) from type locality (1979); 3 shells (No. 4) – Bidzhan River; 2 spms in alcohol (No. 5) – Dobraya River, Jewish Autonomous Province; 1 shell (No. 6) – Bidzhan River at Kvashnino village; 8 shells (No. 7) – former bedriver at Kirovo village; 1 shell (No. 8) – Amur estuary.

Additional records. Bidzhan River basin (coll. M. Zatrawkin, 1987) (ZIN); other records see in Prozorova et al. (2014b).

Ecology. Lives in rivers and slowly flowing waterbodies (Prozorova et al. 2014b), on sandy-silty and gravel-sandy-silty bottom at the depth down to 1 m, population density to 200 spms/m^{-2} in Middle Amur area; occurrence decreases northwards. In Lower Amur area and in the Amur estuary the density decreases to single specimens per m^2, whereas the density of *P. manchouricus* in the same biotopes reaches 100 spms/m^2. Invasion with cercaria of *Clonorchis sinensis* Looss, 1907 in *P. spiridonovi* varies from 0.54 to 42.5% (Zatrawkin et al. 1989). Coexists with *P. manchouricus* (Gerseldt in Bourguignat 1860) (Prozorova et al. 2014b).

HYDROBIIDAE Stimpson, 1865

HYDROBIINAE Stimpson, 1865

The data on 14 hydrobiid species given below are very scanty. Virtually all the species require complex investigations that can result in relocation to other genera and families.

46. *Nurekia triculiformis* Izzatullaev, Sitnikova et Starobogatov, 1985
(Fig. 8Q–R)

History of the name application.

Izzatullaev, Sitnikova and Starobogatov 1985: 59, fig. 3 *3* (description within Pseudocaspiidae);

Kantor and Sysoev 2005; Kantor et al. 2010 (as Cochliopidae, Littoridininae, information about types, type locality and general distribution);

Vinarski and Kantor 2016 (belonged to Littoridininae of Cochliopidae, information about types, type locality, distribution, 'bionomics').

Type locality. South Tajikistan (southern branches of Vakhsh Ridge, Dangarinski District, vicinities of Alimtay, southward from Nurek water reservoir, rotten aryk).

Types. Holotype (in alcohol): No. 1, and 70 paratypes in alcohol from type locality (coll. Z. Izzatulaev, 1975, 1978).

Additional records. No data.

Ecology. No data.

47. *Kainarella minima* Starobogatov, 1972
(Fig. 8S)

History of the name application.

Starobogatov 1972a: 168, fig. 4 (description as Littoridinidae, close to genus *Taihua* Annandale, 1924 from China);

Starobogatov 1994 (mentioned for Eastern Turkmenistan);

Kantor and Sysoev 2005; Kantor et al. 2010 (as Littoridininae of Cochliopidae, information about types, type locality and general distribution);

Izzatulaev and Stadnichenko 2010 (mentioned as spring-dweller);

Vinarski and Kantor 2016 (belonged to Littoridininae of Cochliopidae, information about types, type locality, distribution, 'bionomics').

Type locality. Turkmen SSR, Charshanginsk District, hot spring Khodzha-Kaynar.

Types. Holotype (dry): No. 1, and 13 (dry) paratypes from type locality (coll. S. Ljovuschkin, 1962).

Additional records. No data.

Ecology. No data.

48. *Pseudocaspia ljovuschkini* Starobogatov, 1972
(Fig. 9A–B)

History of the name application.

Birstein and Ljovuschkin, 1965: 313, fig. 2D (record, shell drawing picture, nomen nudum);

Starobogatov 1972: 166, fig. 1 (description within Littoridinidae)

Kabat and Hershler 1993 (possibly *Pseudocaspia* is a senior synonym of *Vetrosia* Radoman, 1977 (Hydrobiidae));

Starobogatov 1994 (mentioned for Eastern Turkmenistan);

Kantor and Sysoev 2005; Kantor et al. 2010 (as Littoridininae of Cochliopidae, information about types, type locality and general distribution);

Vinarski and Kantor 2016 (belonged to Littoridininae of Cochliopidae, information about types, type locality, distribution, 'bionomics').

Type locality. Turkmen SSR, Charshanginsk District, Kaptar-Khana Cave, underground brackish-water pond.

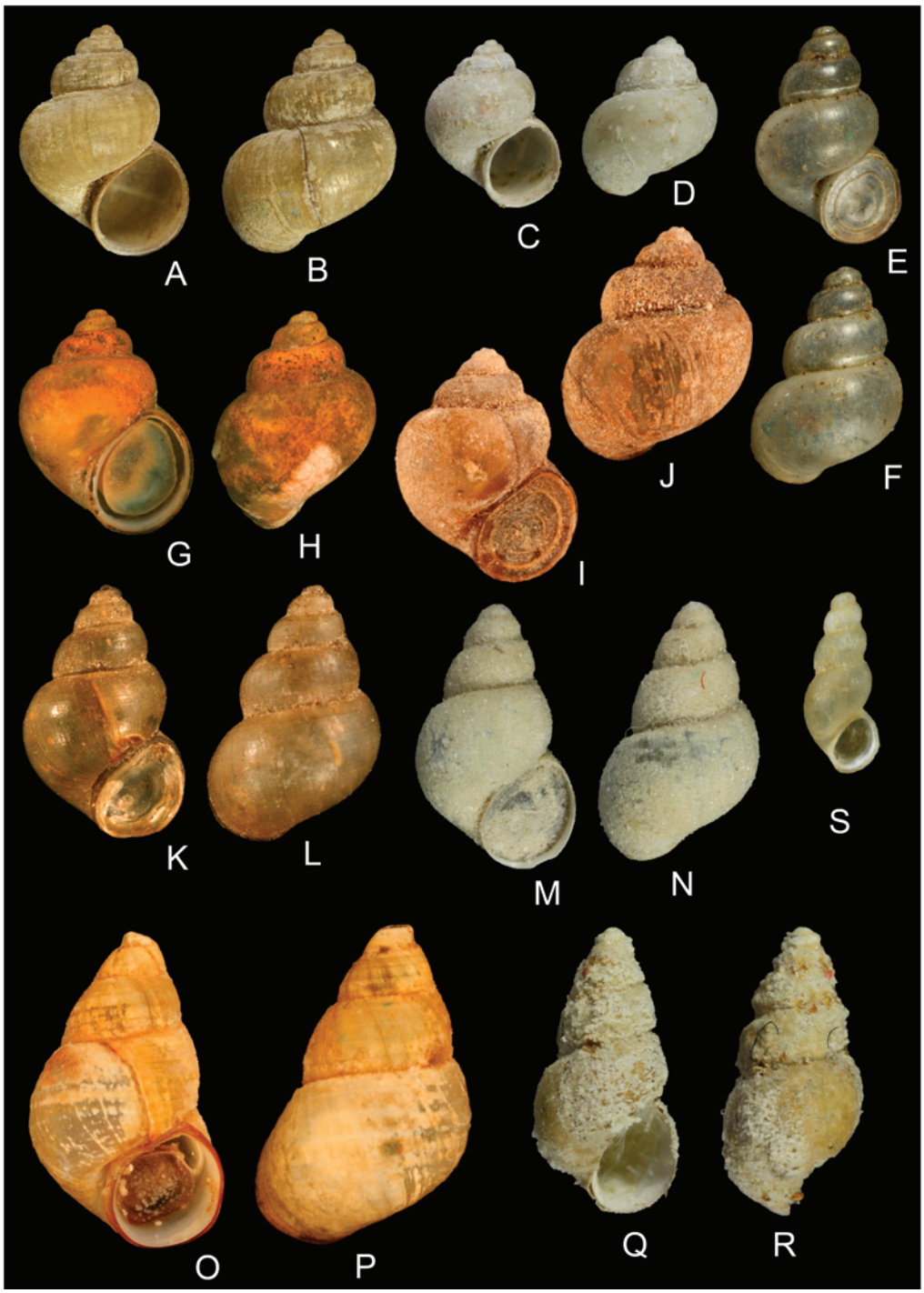

Fig. 8. A–B – *Bithynia valvatoides*, holotype, H = 7.8 mm; C–D – *Bithynia fausseki*, holotype, H = 6.7 mm; E–F – *Bithynia milachevitchi*, holotype, H = 5.1 mm; G–H – *Bithynia ehrmanni*, allotype, male, H = 7.7 mm; I–J – *Bithynia ehrmanni*, holotype, female, H = 8.2 mm; K–L – *Bithynia lindholmiana*, holotype, H = 6.6 mm; M–N – *Gabbiella cyrea*, holotype, H = 6.0 mm; O–P – *Parafossarulus spiridonovi*, holotype, H = 13.1 mm; Q–R – *Nurekia triculiformis*, holotype, H = 4.9 mm; S – *Kainarella minima*, holotype, H = 1.4 mm.

Types. Holotype (dry): No. 1, 10 paratypes (6 in alcohol and 4 dry) from type locality (coll. S. Ljovuschkin, 1963).

Additional records. Underground salt lake in Kaptar-Khana Cave, 8 km from lead mine of Kugitangtau Ridge, Turkmenistan (coll. V. Tanasiichuk, 1965) (ZIN).

Ecology. Judging from the cave description (Orekhov 2003), these snails belong to chemosynthetic trophic chain.

49. *Pseudocaspia kainarensis* Starobogatov, 1972
(Fig. 9C–D)

History of the name application.

Starobogatov 1972a: 167, fig. 3 (description within Littoridinidae);

Starobogatov 1994 (mentioned for Eastern Turkmenistan);

Kantor and Sysoev 2005; Kantor et al. 2010 (as Littoridininae of Cochliopidae, information about types, type locality and general distribution);

Izzatullaev and Stadnichenko 2010 (mentioned as a spring-dweller);

Vinarski and Kantor 2016 (as Littoridininae of Cochliopidae, information about types, type locality, distribution, 'bionomics').

Type locality. Turkmen SSR, Charshanginsk District, hot spring Khodzha-Kaynar.

Types. Holotype (in alcohol): No. 1, and 5 (dry) paratypes from type locality (coll. S. Ljovuschkin, 1963).

Additional records. No data.

Ecology. Habitant of hot springs.

50. *Pseudocaspia starostini* Starobogatov, 1972
(Fig. 9E–F)

History of the name application.

Starobogatov 1972a: 166–167, fig. 2 (description within Littoridinidae);

Starobogatov 1994 (mentioned for Eastern Turkmenistan);

Kantor and Sysoev 2005; Kantor et al. 2010 (as Littoridininae of Cochliopidae, information about types, type locality and general distribution);

Izzatullaev and Stadnichenko, 2010 (mentioned as a spring-dweller);

Vinarski and Kantor 2016 (belonged to Littoridininae of Cochliopidae, information about types, type locality, distribution, 'bionomics').

Type locality. Turkmen SSR, Charshanginsk District, hot spring Khodzha-Kaynar.

Types. Holotype (dry): No. 1 (coll. S. Ljovuschkin, 1963).

Additional records. No data.

Ecology. Inhabits of hot springs together with *P. kainarensis*.

BELGRANDIINAE De Stefani, 1877

51. *Belgrandiella abchasica* Starobogatov, 1962
(Fig. 9G–H)

History of the name application.

Starobogatov 1962: 48, fig. 1 E (description);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Chertoprud and Palatov 2012 (record from Kachkar, north-eastern Turkey);

Vinarski et al. 2014 (record from Southern Caucausus);

Palatov and Vinarski 2015 (records from nearby caves Srednyaya Shakuranskaya and Tsebeldinskaya, and spring-fed reservoirs);

Chertoprud et al. 2016 (mentioned for caves of Gurypshsky region of Western Caucasus);

Turbanov et al. 2016 (records, ecological characteristic);

Vinarski and Kantor 2016 (belonged to Belgrandiinae of Hydrobiidae, information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Nizhnyaya Shakuranskaya Cave, Caucasus.

Types. Holotype (dry): No. 1.

Additional records. Absent in ZIN collection. Kashkar (Chertoprud and Palatov 2012), Tsebeldinskaya, and Nizhneshakuranskaya caves in Abkhazia (Vinarski et al. 2014).

Ecology. Stygobiont species, associated with *Pontohoratia birsteini* in Abkhazia caves (Vinarski et al. 2014). Stygo- and crenobiont (Turbanov et al. 2016).

52. *Belgrandiella caucasica* Starobogatov, 1962
(Fig. 9I)

History of the name application.

Starobogatov 1962: 48, fig. 1 D (description);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Kijashko 2015 (as *Geyeria*, mentioned for Red Book of Krasnodar Territory);

Chertoprud and Palatov 2012 (record from Kachkar, north-eastern Turkey);

Palatov and Vinarski 2015; Turbanov et al. 2016 (records Dolgaya Cave and spring-fed reservoirs of the Black Sea coast from Tuapse to Psou);

Vinarski and Kantor 2016 (as Belgrandiinae of Hydrobiidae, information about types, type locality with coordinates, distribution, 'bionomics');

Palatov et al. 2016 (record from Malaya Khosta River (Krasnodar Territory) near the water edge, which is the result of penetration from coastal spings).

Type locality. Krasnoaleksandrovskaya Cave, Caucasus.

Types. Holotype (dry): No. 1, and paratype (dry): No. 2 – from type locality.

Additional records. Absent in ZIN collection. See "History".

Ecology. Lives on stony bottom of clean running cave waterbodies, at conditions of low organic concentration and high dissolved oxygen content; recorded together with *Paladilhiopsis orientalis* and *Plagigeyeria* (=*Geyeria*) *valvataeformis* (Kijashko 2007).

Remarks. The holotype shell is fragmented. Therefore, we illustrate the paratype No. 2. According to Glöer and Pešić (2014), records of species of the genus *Belgrandiella* from Turkey, Ukraine, Caucasus and Lebanon are questionable and need further confirmation.

53. *Plagigeyeria horatieformis* (Starobogatov, 1962)

(Fig. 9J–K)

History of the name application.

Starobogatov 1962: fig. 1 3Z (з) (description as *Geyeria*)

Starobogatov et al. 2004 (mentioned as *Plagigeyeria* of Belgrandiellidae)

Kantor and Sysoev 2005; Kantor et al. 2010 (as *Geyeria,* information about types, type locality and general distribution)

Vinarski et al. 2014 (record from Southern Caucausus, as "*Geyeria*");

Galli, 2015 (mentioned as *Plagigeyeria*)

Vinarski and Kantor 2016 (as *Geyeria* belonging to Belgrandiinae of Hydrobiidae, information about types, type locality with coordinates, distribution, 'bionomics');

Chertoprud et al. 2016 (as *Plagigeyeria*, mentioned for Gulrypshi Distinct);

Palatovand Vinarski 2015; Turbanov et al. 2016 (as "*Geyeria*", possible records from Tsebeldinskaya Cave).

Type locality. Nizhnyaya Shakuranskaya Cave, Caucasus.

Types. Holotype (dry): No. 1, and 4 paratypes (dry): No. 2 – from type locality.

Additional records. Absent in ZIN collection.

Ecology. Stygobiont species associated with *Pontohoratia birsteini* in 2 caves (Tsebeldinskaya and Nizhneshakuranskaya) in Abkhazia (Vinarski et al. 2014).

54. *Plagigeyeria valvataeformis* (Starobogatov, 1962)

(Fig. 9L)

History of the name application.

Starobogatov 1962: 48–49, fig. 1 Zh (ж) (description as *Geyeria*);

Starobogatov et al. 2004 (mentioned as *Plagigeyeria* of Belgrandiellidae);

Kantor and Sysoev 2005; Kantor et al. 2010 (as *Geyeria*, information about types, type locality and general distribution);

Kijashko 2015 (as *Geyeria*, mentioned for Red Book of Krasnodar Territory);

Vinarski and Kantor 2016 (as *Geyeria* belonged to Belgrandiinae of Hydrobiidae, information about types, type locality with coordinates, distribution, 'bionomics');

Type locality. Krasnoaleksandrovskaya Cave, Caucasus.

Types. Holotype (dry): No. 1 (lost), and 2 fragmented paratypes (dry): No. 2 – from type locality.

Additional records. No data.

Ecology. Lives on stony bottom of clean running cave waterbodies, at conditions of low organic concentration and high dissolved oxygen content; recorded together with *Belgrandiella caucasica* and *Paladilhiopsis orientalis* (Kijashko 2015).

55. *Martensamnicola kazakhstanica* Izzatullaev, Sitnikova et Starobogatov, 1985

(Fig. 9M–N)

History of the name application.

Izzatullaev et al. 1985: 55–56, fig. 3 *1* (description as a new genus and a subfamily Martensamnicolinae);

Starobogatov et al. 2004 (genus mentioned as Belgrandiellidae);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Izzatullaev and Stadnichenko 2010 (mentioned as a spring-dwelling genus);

Vinarski and Kantor 2016 (as Belgrandiinae of Hydrobiidae, information about types, type locality, distribution, 'bionomics').

Type locality. Kazakhstan, Chimkent Province, spring near Vannovka village.

Types. Holotype (in alcohol): No. 1 and 3 (in alcohol) paratypes under No. 2.

Additional records. No data.

Ecology. Lives in springs (Izzatullaev and Stadnichenko 2010).

56. *Sibirobythinella kuznetzkiana* Johansen et Starobogatov, 1982

(Fig. 9O–P)

History of the name application.

Johansen and Starobogatov 1982: 1142–1144, fig. a, v (b) (description within Triculidae = Triculinae of Pomatiopsidae; shell measurements, radular teeth morphology);

Davis 1993 (mentioned as not a triculine snail);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution); Izzatulaev et al. 1985 (mentioned as Belgrandiellinae);

Grebennikov and Vinarski, 2010 (mentioned in Red book as Pomatiopsidae);

Glöer et al. 2014 (as Pomatiopsidae, compared with *Chirgisia alaarchaensis* Glöer, Boeters & Pešić of Hydrobiidae);

Vinarski and Kantor 2016 (belonged to Triculinae of Pomatiopsidae, information about types, type locality, distribution, 'bionomics').

Type locality. Kuznetzk Alatau Mountains (southern Siberia), "lime-tree island", stream on the right bank of Tom River 2.5 km downstream from Kazyr, station 95, samples 163–165.

Types. Holotype (dry): No. 1, and 430 paratypes (dry): No. 2 – from type locality.

Additional records. Absent in ZIN collection.

Ecology. No exact data.

57. *Sibirobythinella almaatina* Izzatullaev, Sitnikova et Starobogatov, 1985

(Fig. 9Q)

History of the name application.

Izzatullaev et al. 1985: 56–57, fig. 3 *2* (description as Belgrandiellinae);

Kantor and Sysoev 2005; Kantor et al. 2010 (as Triculinae, information about types, type locality and general distribution);

Glöer et al. 2014 (as Pomatiopsidae, compared with *Chirgisia alaarchaensis*);

Izzatullaev et al. 2013 (ecology);

Vinarski and Kantor 2016 (as Triculinae of Pomatiopsidae, information about types, type locality, distribution, 'bionomics').

Type locality: Alma-Ata Region (Kazakhstan), Zailiyskiy Alatau (Ridge), spring Belbulak and vicinities of Talgar.

Types. Holotype (dry): No. 1, and paratype (in alcohol): No. 2 – from type locality; 8 paratypes (dry): No. 3 – Alma-Ata Province (Kazakh SSR), Almaty Reserve, spring in the vicinities of Talgar.

Additional records. No data.

Ecology. Crenophylic, lives in springs with water temperature of 7–11 °C, on sand grains, on small stones and on leaves of water plants (Izzatullaev et al. 2013).

58. *Pontohoratia birshteini* (Starobogatov, 1962)

(Fig. 9R–S)

History of the name application.

Starobogatov 1962: 42, fig. 1A (a) (description as *Horatia* Bourguignat, 1887);

Starobogatov et al. 2004 (mentioned in genus *Pseudohoratia* Radoman, 1967 of Horatiidae (now = Belgrandiellinae));

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Vinarski et al. 2014 (holotype photo, as *Pontohoratia* Vinarski, Palatov and Glöer, 2014, record from Southern Caucausus, shell measurements, protoconch sculpture, penis morphology);

Chertoprud et al. 2016 (mentioned for caves of Gulrypshsky Distinct in Abkhazia);

Vinarski and Kantor 2016 (as Belgrandiinae of Hydrobiidae, information about types, type locality with coordinates, distribution, 'bionomics').

Type locality. Tsebeldinskaya Cave, Abkhazia.

Types. Holotype (dry): No. 1.

Additional records. Absent in ZIN collection. Nizhne-Shakuranskaya Cave (Vinarski et al. 2014).

Ecology. Rheophilic species (flow velocity up to 0.3 m/sec), lives on hard substrates, stygobiont species coexisting with *Belgrandiella abchasica*, *Paladilhiopsis schakuranica* and *Plagigeyeria horatieformis* (Vinarski et al. 2014).

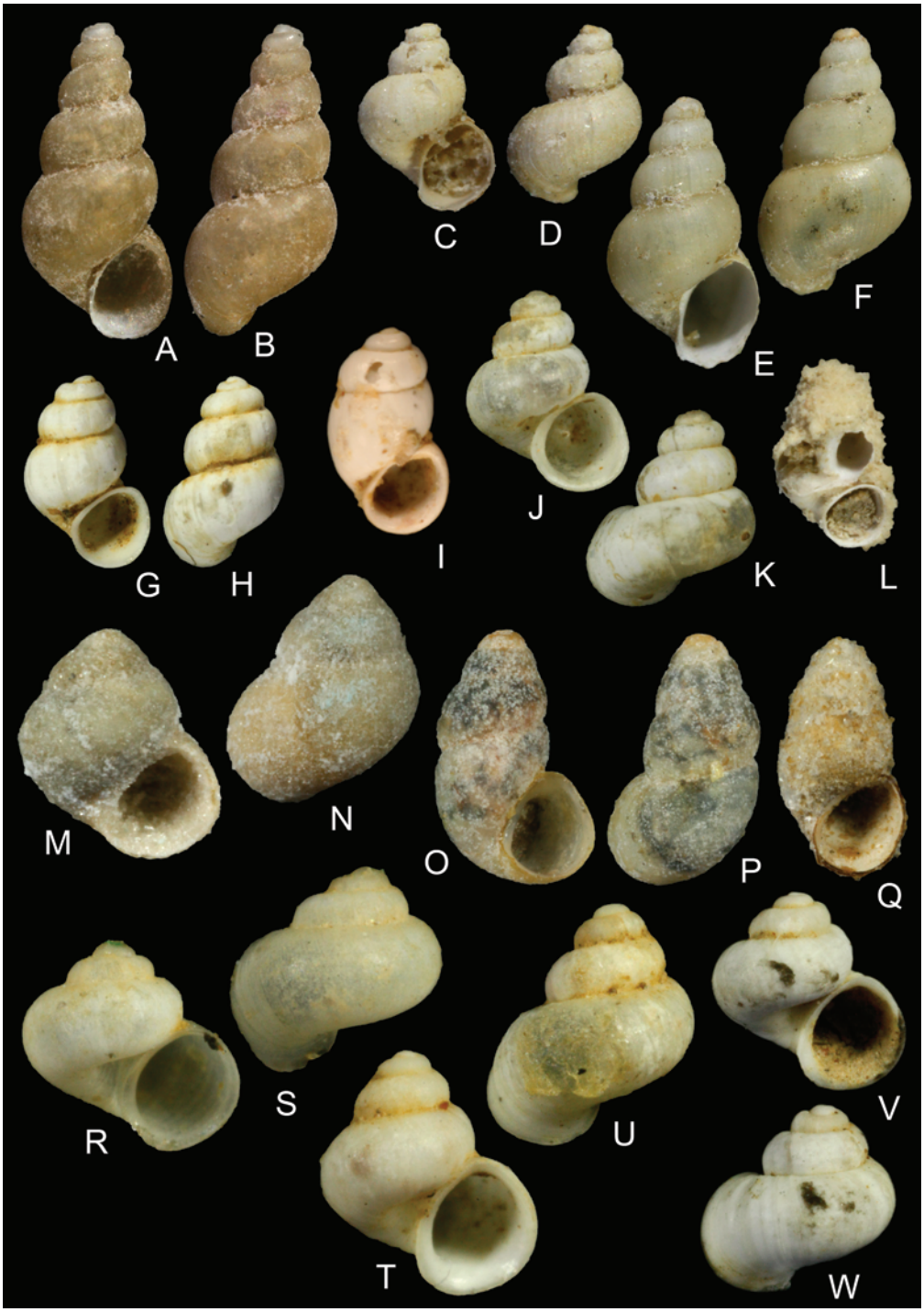

Fig. 9. A–B – *Pseudocaspia ljovuschkini*, holotype, H = 3.7 mm; C–D – *Pseudocaspia kainarensis*, holotype, H = 1.7 mm; E–F – *Pseudocaspia starostini*, holotype, H = 3.2 mm; G–H – *Belgrandiella abchasica*, holotype, H = 1.9 mm; I – *Belgrandiella caucasica*, paratype No. 2, H = 1.5 mm; J–K – *Plagigeyeria horatieformis*, holotype, H = 1.7 mm; L – *Plagigeyeria valvataeformis*, paratype No. 2, H = 1.4 mm; M–N – *Martensamnicola kazakhstanica*, holotype, H = 1.7 mm; O–P – *Sibirobythinella kuznetzkiana*, holotype, H = 2.1 mm; Q – *Sibirobythinella almaatina*, holotype, H = 2.2 mm; R–S – *Pontohoratia birsteini*, holotype, H = 1.5 mm; T–U – *Pontohoratia ljovuschkini*, holotype, H = 1.7 mm; V–W – *Pontohoratia sokolovi*, holotype, H = 1.5 mm.

59. *Pontohoratia ljovuschkini* (Starobogatov, 1962)
(Fig. 9T–U)

History of the name application.
Starobogatov 1962: 44, fig. 1 G (г) (description as *Horatia*);
Kantor and Sysoev 2005; Kantor et al. 2010 (as *Horatia*, information about types, type locality and general distribution);
Vinarski et al. 2014 (holotype photo, as a synonym of *Pontohoratia birshteini*);
Vinarski and Kantor 2016 (as a synonym of *Pontohoratia birshteini*).
Type locality. Nizhne-Shakuranskaya cave, Caucasus.
Types. Holotype (dry): No. 1.
Additional records. No data.

60. *Pontohoratia sokolovi* (Starobogatov, 1962)
(Fig. 9V–W)

History of the name application.
Starobogatov 1962: 43–44, fig. 1 B (б) (description as *Horatia*);
Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);
Vinarski et al. 2014 (holotype photo, as a synonym of *Pontohoratia birshteini*);
Vinarski and Kantor 2016 (as a synonym of *Pontohoratia birshteini*).
Type locality. Nizhne-Shakuranskaya Cave, Caucasus.
Types. Holotype (dry): No. 1, and 3 paratypes (dry): No. 2 – from type locality.
Additional records. No data.

61. *Paladilhiopsis aculeus* Starobogatov, 1962
(Fig. 10A)

History of the name application.
Starobogatov 1962: 47, fig. 2 G (г) (description);
Starobogatov et al. 2004 (within Belgrandiellidae);
Kantor and Sysoev 2005; Kantor et al. 2010 (as Belgrandiinae of Hydrobiidae, information about types, type locality, and general distribution);
Barjadze et al. 2015 (mentioned as Moitessieriidae for Georgian karst caves);
Vinarski and Kantor 2016 (as Belgrandiinae of Hydrobiidae, information about types, type locality with coordinates, and general distribution).
Type locality. Nizhne-Shakuranskaya Cave, Caucasus.
Types. Holotype (dry): No. 1 and paratype (dry): No. 2 – from type locality.
Additional records. No data.
Ecology. Lives in waters of caves, together with *P. schakuranica* (Starobogatov 1962). Stygobiont (Turbanov et al. 2016).

62. *Paladilhiopsis schakuranica* Starobogatov, 1962
(Fig. 10B–C)

History of the name application.
Starobogatov, 1962: 47, fig. 2 Zh (ж) (description);
Kantor and Sysoev 2005; Kantor et al. 2010 (belonged to Belgrandiinae of Hydrobiidae, information about types, type locality and general distribution);
Vinarski et al. 2014 (mentioned for South Caucasus);
Barjadze et al. 2015 (mentioned as Moitessieriidae for Georgian karst caves);
Chertoprud et al. 2016; Turbanov et al. 2016 (mentioned for caves of Gulrypshi Distinct of Abkhazia);
Vinarski and Kantor 2016 (as Belgrandiinae of Hydrobiidae, information about types, type locality with coordinates, and general distribution).
Type locality. Nizhne-Shakuranskaya Cave, Caucasus.
Types. Holotype (dry): No. 1.
Additional records. No data.
Ecology. Found together with *Pontohoratia birshteini, Bergrandella abchasica* and *Plagigeyeria horatieformis* (Starobogatov 1962; Vinarski et al. 2014). Stygobiont (Turbanov et al. 2016).

63. *Paladilhiopsis orientalis* Starobogatov, 1962
(Fig. 10D–F)

History of the name application.
Starobogatov 1962: 46–47, fig. 2 D (д) (description);
Kantor and Sysoev 2005; Kantor et al. 2010 (as Belgrandiinae of Hydrobiidae, information about types, type locality and general distribution);
Turbanov et al. 2016 (mentioned);
Vinarski and Kantor 2016 (as Belgrandiinae of Hydrobiidae, information about types, type locality with coordinates, and general distribution).
Type locality. Krasnoaleksandrovskaya Cave, Caucasus.
Types. Holotype (dry): No. 1, and paratype (dry): No. 2 – from type locality.

Additional records. No data.

Ecology. Found together with *P. pulcherrima* and *P. subovata* in cave waters (Starobogatov 1962). Stygobiont (Turbanov et al. 2016).

64. *Paladilhiopsis pulcherrima* Starobogatov, 1962 (Fig. 10G–H)

History of the name application.

Starobogatov 1962: 47, fig. 2 A–B (а, б) (description);

Kantor and Sysoev 2005; Kantor et al. 2010 (belonged to Belgrandiinae of Hydrobiidae, information about types, type locality and general distribution);

Palatov and Vinarski 2016; Turbanov et al. 2016 (records from helocrenes and rheocrenes on the Black Sea coast from Tuapse to Psou);

Vinarski and Kantor 2016 (belonged to Belgrandiinae of Hydrobiidae, information about types, type locality with coordinates, and general distribution).

Type locality. Krasnoaleksandrovskaya Cave, Caucasus.

Types. Holotype (dry): No. 1, and 7 paratypes (dry): No. 2 – from type locality.

Additional records. Absent in ZIN collection. See "History".

Ecology. Stygo- and crenobiont (Turbanov et al. 2016).

65. *Paladilhiopsis shadini* Starobogatov, 1962 (Fig. 10I–J)

History of the name application.

Starobogatov 1962: 45–46, fig. 2V (в) (description);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Vinarski et al. 2014 (record for Southern Caucasus);

Barjadze et al. 2015 (record as Moitessieriidae for Georgian karst caves);

Chertoprud et al. 2016 (mentioned for New Athos Cave of Gudarsky Distinct);

Palatov and Vinarski 2015; Turbanov et al. 2016 (records of empty shells in Lake Anatoliya, Novoafonskaya Cave);

Vinarski and Kantor 2016 (belonged to Belgrandiinae of Hydrobiidae, information about types, type locality with coordinates, and general distribution).

Type locality. Tzebelda Cave, Caucasus.

Types. Holotype (dry): No. 1.

Additional records. Absent in ZIN collection. See 'History'.

Ecology. Stygobiont (Turbanov et al. 2016).

66. *Paladilhiopsis subovata* Starobogatov, 1962 (Fig. 10K–L)

History of the name application.

Starobogatov 1962: 46, fig. 2E (е) (description);

Kantor and Sysoev 2005, Kantor et al. 2010 (information about types, type locality and general distribution);

Turbano et al. 2016 (mentioned);

Vinarski and Kantor 2016 (as Belgrandiinae of Hydrobiidae, information about types, type locality and general distribution).

Type locality. Krasnoaleksandrovskaya Cave, Caucasus.

Types. Holotype (dry): No. 1, and paratype (dry): No. 2 – from type locality.

Additional records. No data.

Ecology. Stygobiont (Turbanov et al. 2016).

LITHOGLYPHIDAE Troschel, 1857

BENEDICTIINAE Clessin, 1880

A certain morphological similarity between benedictiines and lithoglyphids was supported by molecular phylogenetic studies (Wilke et al. 2001). The subfamily is endemic of Bailkal Lake and includes 16 species distributed within 3 genera (Sitnikova et al. 2004). However, the real number of species will probably be considerably reduced due to currently performing molecular studies.

67. *Benedictia nana* Beckman et Starobogatov, 1975 (Fig. 10M–N)

History of the name application.

Beckman and Starobogatov 1975: 101, fig. 3 G (г) (description as *B.* (*Baicalocochlea*) *nana*);

Sitnikova 1987, 1995 (as *Benedictia* (*Benedictia*), shell drawing, key to identification);

Sitnikova et al. 2004 (mentioned);

Kantor and Sysoev 2005; Kantor et al. 2010 (as Lithoglyphidae, information about types, type locality and general distribution);

Vinarski and Kantor 2016 (as Benedictiidae, information about types, type locality and general distribution).

Type locality. Near Sosnovkaya Bank (North Baikal Lake), depth 300 m.

Types. Holotype (in alcohol): No. 1.

Additional records. No data.

Remarks. This is an enigmatic species. Numerous and many-year attempts to collect it in the type

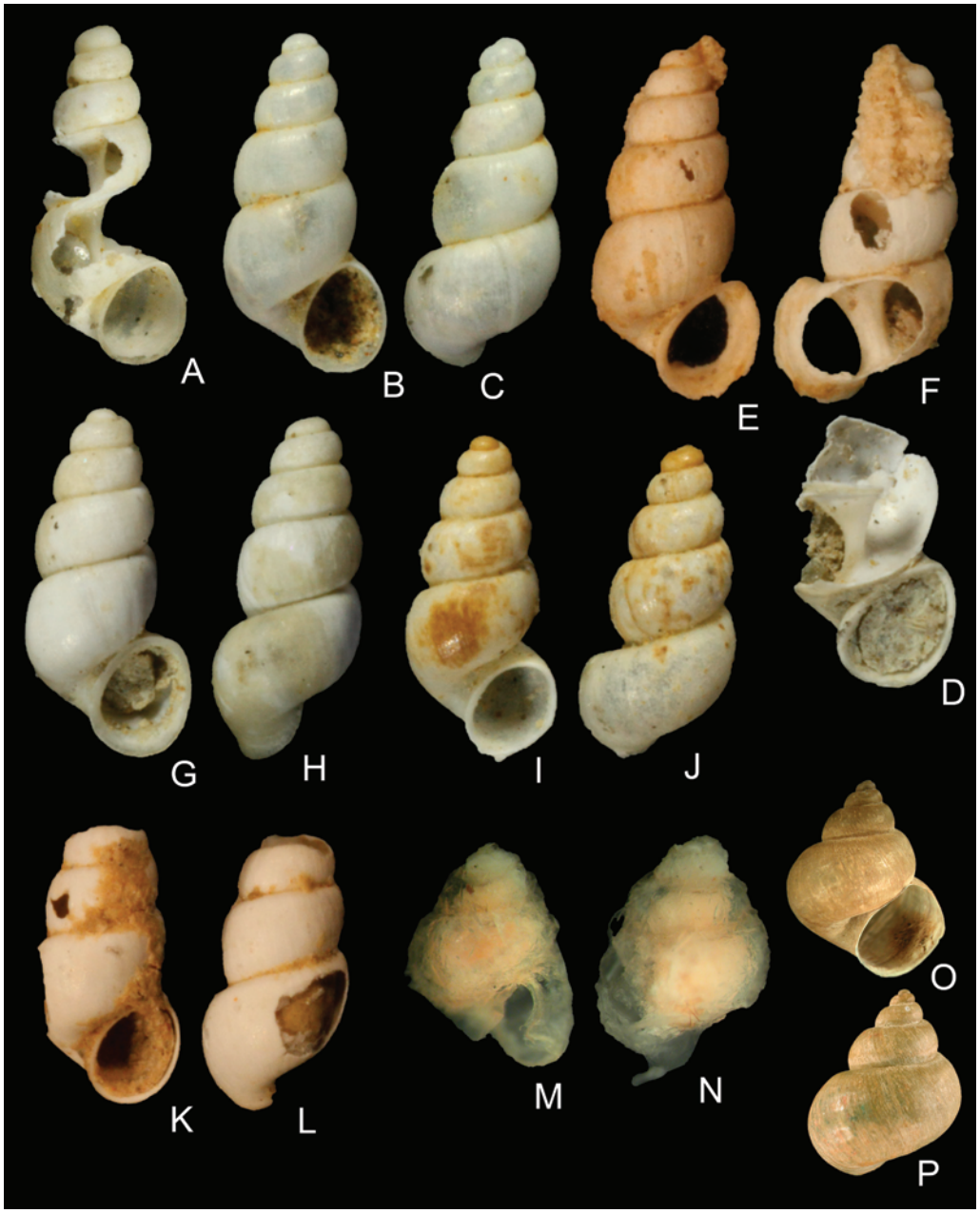

Fig. 10. A – *Paladilhiopsis aculeus*, holotype, H = 1.7 mm; B–C – *Paladilhiopsis schakuranica*, holotype, H = 1.9 mm; D – *Paladilhiopsis orientalis*, holotype, H = 1.5 mm; E–F – *Paladilhiopsis orientalis*, paratype No. 2, H = 2.0 mm; G–H – *Paladilhiopsis pulcherrima*, holotype, H = 1.8 mm; I–J – *Paladilhiopsis shadini*, holotype, H = 1.9 mm; K–L – *Paladilhiopsis subovata*, paratype No. 2, H = 1.8 mm; M–N – *Benedictia nana*, holotype, H = 3.2 mm; O–P – *Benedictia shadini*, holotype, H = 21 mm.

locality have failed despite the use of special equipment for deep-water fauna collection. Only living snails *Pseudomegalovalvata profundicola* Beckman et Starobogatov, 1975 (Valvatidae) and *Choanomphalus planorbiformis* Beckman et Starobogatov, 1975 (Planorbidae) were collected on sandy bottom with detritus of Sosnovkaya Bank, at 300–400 m.

68. *Benedictia shadini* Beckman et Starobogatov, 1975
(Fig. 10O–P)

History of the name application.

Beckman and Starobogatov 1975: 100–101, fig. 35 (B). (description as *B.* (*Baicalocochlea*) = *Benedictia maxima* (part.) sensu Lindholm 1909 and Shadin 1952);

Sitnikova 1987, 1995 (shell drawing, key to identification);

Sitnikova et al. 2004 (mentioned);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Vinarski and Kantor 2016 (as Benedictiidae, information about types, type locality and general distribution).

Type locality. Maloe More (Baikal Lake).

Types. Holotype (dry): No.1.

Additional records. Besides Maloe More, the species was found in the range of Chivyrkui Bay (north-eastern area of the lake).

Ecology. Found on sandy-silty bottom with detritus, at the depth of 39–200 m, sometimes together with *B. maxima* (Dybowski, 1875) (Beckman and Starobogatov 1975; unpublished data).

CERITHIOIDEA Fleming, 1822

MELANOPSIDAE H. et A. Adams, 1854

The ex-USSR fauna formally contained 19 species of the family: the genera *Esperiana* Bourguignat, 1870, *Microcolpia* Bourguignat, 1884 and *Melanopsis* Férussac, 1807 (Kantor et al. 2010). Ten species of them were described by Starobogatov (Starobogatov and Izzatulaev 1980, 1984, 1985; Starobogatov et al. 1992); 2 species were described from waterbodies of Europe, and 2 species – from eastern Iran, and others from republics of the ex-USSR. Below we provide information about these species requiring additional study and confirmation of the species/subspecies status.

69. *Esperiana dneprensis* (Starobogatov, Alexenko et Levina, 1992)
(Fig. 11A–B)

History of the name application.

Starobogatov et al. 1992: 64, fig. 3 (11) (as *Fagotia* (*Dneprifagotia*), distribution: rivers of north-western Black Sea maritime area: Danube, Dniester, South Bug, Dnieper);

Anistratenko 1998 (key to identification);

Gradowski and Stadnichenko 1998 (trematode invasion);

Anistratenko and Anistratenko 2001 (key to identification, shell description, distribution);

Gradowski 2001a (records from Lower and Middle Dnieper, Ingultz, South Bug, Middle Dniester);

Gradovski 2001b (record of 8 species of trematode parasites);

Pershko 2003 (shell variability, populations from South Bug and Dnieper rivers, comparison with other Ukrainian species);

Pershko and Bondarchuk 2003 (as *F. danubialis*, shell size from Sluchi River);

Starobogatov et al. 2004 (as *Fagotia* Bourguignat, 1884, key to identification);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Stadnichenko and Stelmashchuk 2010 (histology and histochemistry of digestive gland);

Stelmashchuk and Stadnychenko 2011 (general information about species of the genus *Fagotia*);

Pershko 2011 (as *Fagotia*, karyotype, 2n=34);

Vinarski and Kantor 2016 (as a synonym of *Fagotia esperi* (Férussac, 1823)).

Type locality. Dnieper River near Kherson.

Types. Holotype (dry), No. 1; paratypes (all dry): No. 2 (1) from type locality (coll. Brauner, registration date 1935); No. 3 (9) from Dnieper at Kherson; Ekaterinoslav, Dnieper rapids (1832, collection of Krynicki); No. 4 (1) from Bug River (coll. Andrzejowski); No. 5 (3) Dniester mouth, spit (coll. Milaschewitsch); No. 6 (1) from South Bug, bay at Petrovka (coll. D. Beling, 1925); No. 7 (5) from Dniester River (coll. Buchinski); No. 8 (1) from Kherson (coll. Brauner); No. 9 (1) Dnieper River mouth (coll. Brauner); No. 10 (2) from Bug; No. 11 (1) without label; No. 12 (2) South Bug River, bay at Petrovka (coll. D. Beling, 1925); No. 13 (107) from Black Sea at Moldavian coast, near Zhebriyan settlement (coll. S. Zernov, 1911); No. 14 (1) from vicinities of Kiev (1834, no data about collector).

Additional records. South Bug at Migeya village, rapids (coll. of 1989, det. Ya. Starobogatov, no

other data, ZIN); Dniester River (Pershko 2003); as *F. danubialis* – Sluchi River, a tributary of Goryn River (Pershko and Bondarchuk 2003).

Ecology. Rheophilic species. Lives in β-mesosaprobious waters (Pershko and Bondarchuk 2003).

Remarks. The species was described within subfamily Fagotiinae Starobogatov, 1992, but the validity of the latter was not then adopted (Bouchet et al. 2005). Starobogatov et al. (1992) compared this species with *Fagotia* (=*Esperiana*) *danubialis* Bourguignat, 1884, *F. berlani* Bourguignat, 1884 and *F. locardiana* Bourguignat, 1884. All the latter species are currently considered as synonyms of *Esperiana* (=*Fagotia*) *esperi* (Férussac, 1823) (Bank 2013; de Yong et al. 2014; Bouchet 2015).

70. *Esperiana roseni* (Starobogatov in Starobogatov, Alexenko et Levina, 1992)
(Fig. 11C–D)

History of the name application.

Starobogatov et al. 1992: 62, fig. 3 *4, 5* (description as *Fagotia* (*Locardiana*));

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution).

Type locality. Quarternary deposits near Kulevi (formerly Redut-Kaleh), Georgia.

Types. Holotype (dry), No. 1, and paratype No. 2 (1 shell) from type locality (coll. unknown).

Additional records. North Turkey (coll. unknown, ZIN No. 2, det. Ya. Starobogatov).

Ecology. No data.

Remarks. The species is similar to *E. danubialis* and *E. esperi* (Starobogatov et al. 1992).

71. *Microcolpia ucrainica* Starobogatov, Alexenko et Levina, 1992
(Fig. 11E–F)

History of the name application.

Starobogatov et al. 1992: 69, fig. 3 *20* (description as *Microcolpia (Potamoctebiana*), distribution: Danube, Dniester, South Bug and Dnieper rivers);

Anistratenko 1998 (key to identification);

Gradowski and Stadnichenko 1998 (possibly as *Fagotia acicularis* (Férussac, 1823), trematode invasion in Dniester, with the invasion incidence of 54.5%);

Anistratenkoand Anistratenko 2001 (key to identification, shell morphology, distribution);

Pershko 2003 (shell characters compared with Ukrainian *Microcolpia* and *Fagotia* species);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Stadnichenko and Stelmashchuk 2010 (no differences within Ukrainian Melanopsidae in histology and histochemistry of digestive gland);

Vinarski and Kantor 2016 (as a synonym of *Fagotia acicularis*).

Type locality. South Bug River (Ukraine).

Types. Holotype (dry): No. 1; paratypes: 10 shells from type locality (from the same sample as holotype), coll. V. Shadin, 1925); 2 shells from Bug River (No. 3, coll. Andrzejowski, registration in 1901); 2? shells (No. 4) – sandbank of Dniester (coll. Milaschewitsch); 1 shell (No. 5) – Inguletz River (= Ingul), small tributary of the Dnieper (coll. Brauner, registration date – 1935); 1 shell (No. 6) – Lanshitze town on Danube, Hungary (Obert, 1848); 2 shells (No. 7) – Dniester basin (coll. E. Slastenko, 1930); 1 shell (No. 8) – South Bug at Vinnitsa (coll. Beling, 1929); 1 shell (No. 9) – debris at entrance to liman, Dniester (coll. Ya. Starobogatov, 1958).

Additional records. Absent in ZIN collection. Gorin River, a tributary of the Pripyat River (Pershko 2003).

Ecology. Rheophilic species.

72. *Microcolpia schileykoi* Starobogatov, 1992
(Fig. 11G–H)

History of the name application.

Starobogatov et al. 1992: 67, fig. 3, *18* (description as *M.* (*Microcolpia*), synonymy: *Melanopsis audebardi* Prevost 1824 (partim));

Reischuetz von 1994 (as a synonym of *Esperiana* (*Microcolpia*) *daudebartii* (Ferussac, 1823));

Vinarski and Kantor 2016 (as a synonym of *Fagotia acicularis* (Férussac, 1823)).

Type locality. Thermal springs at Vöslau, 25 km southward of Vienna, Austria.

Types. Holotype (in alcohol): No. 1. Paratypes: 18 spms in alcohol (No. 2) from type locality (coll. A. Schileyko, 1990); 1 shell (No. 3) – Ober-Ungarn, Hungary (coll. Milaschevitsch, without date).

Additional records. No data.

Ecology. Lives in thermal waters (Starobogatov et al. 1992).

Remarks. The type specimens were initially identified by Schileyko and Starobogatov as *M. daudebardi* and/or *M. thermalis* (Brot, 1868).

73. *Microcolpia inconspicua* Starobogatov, 1992
(Fig. 11I–J)

History of the name application.
Starobogatov et al. 1992: 66, fig. 3, *17* (description, synonymy: *Melanopsis audebardi* Prevost, 1824 (partium); *M. audebartii* C. Pfeiffer, 1828 (partium?); *Hemisinus acicularis var. audebartii* Clessin, 1887 non Deshayes in J. Férrusac, 1823; *H. thermalis* Clessin, 1887 non Brot, 1868);
Reischuetz von 1994 (as a synonym of *Esperiana* (*Microcolpia*) *daudebartii* (Ferussac, 1823));
Vinarski and Kantor 2016 (as a synonym of *Fagotia acicularis* (Férussac, 1823)).

Type locality. Thermal springs, Vienna City.

Types. Holotype (dry): No. 1; paratypes: 1 shell (No. 2) from type locality (coll. Philippi, no date); 91 spms in alcohol (No. 3) – thermal springs at Vöslau, 25 km southward of Vienna, Austria (coll. A. Schileyko, 1990). (paratypes No. 2 were reidentified by Ya. Starobogatov as *M. schileykoi*).

Additional records. No data.

Ecology. Lives in thermal waters (Starobogatov et al 1992).

Remarks. All three species of *Microcolpia*, described by Starobogatov, are cited in the database Fauna Europaea (Bank 2013) as synonyms of *Fagotia* (*Microcolpia*) *daudebartii acicularis* (de Jong et al. 2014). Bouchet and Rosenberg (2015) in WoRMS cite *Fagotia* as a synonym of *Esperiana*, while *Microcolpia* as a valid genus.

74. *Melanopsis ashkhabadensis*
Izzatullaev et Starobogatov, 1984
(Fig. 11K–L)

History of the name application.
Izzatullaev and Starobogatov 1984: 1480, fig. 1 *14,* 3 *8* (description as *M.* (*Canthidomus*), radular central tooth morphology, key to identification);
Starobogatov 1994 (mentioned for Kopetdagh Province of Turkmenistan);
Starobogatov et al. 2004 (key to identification, general distribution);
Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);
Izzatulaev et al. 2013 (ecology);
Vinarski and Kantor 2016 (information about types, type locality and general distribution).

Type locality. Ashkhabad, rapid mountain springs – Feryuza, Guli, etc. (former Turkmen SSR).

Types. Holotype (in alcohol), No.1. Paratypes: No. 2 (13 in alcohol) from type locality; No. 3 (4 in alcohol) from Zakaspiysk Province, from Sekie-Yata springs near Geok-Tepe (coll. Bukinich, 1924); No. 4 (2) from Svyatoi Kluch near Ashkhabad (coll. Bukinich, 1925); No. 5 (12 in alcohol) from Askhabadka River, Zakaspiysk Province (coll. P. Varentsov, 1896); No. 6 (4 in alcohol) from Zakaspiysk Province (coll. Zarydnyi, 1892); No. 7 (70 in alcohol, 3 of them dissected) from Germab (Mikhailovskoye), Askhabad mouth (1909); No. 8 (14 in alcohol) from sulphuric spring Argman (1892); No. 9 (1 in alcohol) – Khotrung River, foothills of Kopetdagh (26 km on the road from Ashkhabad to Firyuza), aryk rapidly flowing from mountains (coll. exp. Kauchukonas, 1932.); No. 10 (2 dry) – Turkestan, Geok-Tepe (coll. Anger, 1896); No. 11 (1 dry) from "Zolotoi Klyuch" aryk near Ashkhabad (coll. Molchanov, 1935); No. 12 (15 dry) from Zakaspiysk Province (coll. Varentsov, date of registration 1896); No. 13 (2 dry) from spring Sakis yaba at Geok-Tepe (coll. Bukinich, 1924); No. 14 (2 dry) Ashkhabad (coll. Boettger, 1935); No. 15 (1 dry) – Geok-Tepe (Kopetdagh) (coll. Lindholm, 1935).

Additional records. No data.

Ecology. Psammorheophilous, lives at the temperature of 7–11 °C, on silt and sand (Izzatulaev et al. 2013). Found together with *M. starostini, M. roseni* and *M. zarudnyi*.

75. *Melanopsis roseni*
Izzatullaev et Starobogatov, 1984
(Fig. 11M–N)

History of the name application.
Izzatullaev and Starobogatov 1984: 1479, fig. 1, *11* (description as *M.* (*Canthidomus*), key to identification);
Starobogatov 1994 (mentioned for Kopetdagh Province of Turkmenistan);
Starobogatov et al. 2004 (key to identification, general distribution);
Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);
Izzatulaev et al. 2013 (ecology);
Vinarski and Kantor 2016 (information about types, type locality and general distribution).

Type locality. Zakaspiysk Province (former Turkmen SSR).

Types. Holotype (dry): No. 1; paratypes: 11 shells from Zakaspiysk Province, Ashkhabadka River (P. Varentzov, 1896): No. 2; 22 dried spms – Ashkhabad, in rapid mountain brooks (S. Korzhinski, 1895): No. 3; 13 spms in alcohol from Zakaspiysk

Province, Ashkhabadka River at Germab village (= Mikhailovskoye) (N. Shavrov, 1909): No. 4; 5 spms in alcohol from sulphurous spring Argman (Zarudnyi, 1892): No. 5; 2 spms in alcohol from Zakaspiysk Province (Zarudnyi, 1892): No. 6; 4 spms in alcohol from Kopetdagh foothills, 26 km on the road from Ashkhabad to Firyuza, in aryks, rapidly flowing rivers – Kortunz River basin (1930): No. 7; 1 spm in alcohol from Ashkhabad Province, Gyaure brook irrigating the 1st May collective farm (M. Orekhov, 1963): No. 8; 6 shells from Turkestan, Geok-Tepe, at aryk Anger , 1896: No. 9; 1 shell from Zakaspiysk Province, Germab (= Mikhailovskoje), Kopetdagh mountains (B. Schkaff, 1916): No. 10; 20 shells from Zolotoi Klyuch near Ashkhabad (L. Molchanov, 1935): No. 11; 2 shells from Anau, 8 miles from Ashkhabad, alluvial shells in ravines (Bukinich, 1926): No. 12; 7 and 6 shells from Zakaspiysk Province (Varentzov, 1896): Nos. 13 and 14.

Additional records. Turkmenistan, Chulinka River head, upstream from settlement; in river at Chevers settlement, Sekizya River head (coll. I. Muratov, 1990; det. Ya. Starobogatov) (ZIN).

Ecology. Psammorheophilous, lives at water temperature from 7 to 11 °C, on silt and sand (Izzatulaev et al. 2013). According to labels of samples stored in the ZIN, it was found together with *Melanopsis ashkhabadensis* and *M. starostini*.

76. *Melanopsis starostini* Izzatullaev et Starobogatov, 1984

(Fig. 11O–P)

History of the name application.

Izzatullaev and Starobogatov 1984: 1480, fig. 1 *13,* 3 *7* (description as *M.* (*Canthidomus*), key to identification);

Starobogatov 1994 (mentioned for Kopetdagh Province of Turkmenistan);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Izzatulaev et al. 2013 (ecology);

Vinarski and Kantor 2016 (as *M.* (*Canthidomus*), information about types, type locality with coordinates, and general distribution).

Type locality. Gennob or Germab (=Mikhailovskoe?) (Central Kopetdagh (former Turkmen SSR).

Types. Holotype (dry): No. 1 and 2 dry paratypes from the same sample of type locality (coll. Lindholm W.): No. 2; other paratypes: 10 spec. in alcohol (No. 3) from Ashkhabad, in mountain rapidly running brooks, Firyuza (= Perveze Archibal), etc. (coll. Korzhinski, 1895); 2 spms in alcohol (No. 4), 3 shells (No. 16) and 5 shells (No. 18) from Askhabadka River, Zakaspiysk Province, Turkestan (coll. Varentzov, 1896); 3 spms in alcohol (No. 5) from sulphurous spring Archman, Central Kopetdagh (coll. Zarudnyi N., 1892); 1 (No. 6, coll. Zarudnyi, 1892) and 41 (No. 7, coll. Shavrov, 1909) in alcohol from nearby springs of Germab, 2 spms in alcohol (No. 8, coll. M. Orekhov, 1963) from Bagir brooks irrigating the Kommunism collective farm, Ashkhabat (sic) district; 9 spms in alcohol (No. 9, coll. L. Bianki, 1930) from stones of aryk rapidly running fom mountains to a river in Kopetdagh foothills; 28 spms in alcohol (No. 10, coll. N. Zarudnyi, 1892) from Zakaspiysk Province; 10 spms in alcohol (No. 11, coll. Bukinich, 1924) from thermal sources at Geok-Tepe (= Gyokdepe); 3 shells (No. 11, coll. Anger, 1886), at aryk Geok-Tepe (= Gyokdepe); 8 shells (No. 13, coll. Starostin, 1939) from Khan-Kyariz, Turkmenistan; 62 shells (No. 14, coll. L. Molchanov, 1935) from "Zolotoi Klyuch" near Ashkhabad; 1 shell (No. 15, Westerlund collection); 1 destroyed shell (No. 17, coll. Bukinich, no date) from alluvial shell limestone in Annau, vicinities of Ashkhabad; 4 shells (No. 19, coll. Bukinich, 1924) from sources near Geok-Tepe (= Gyokdepe); 1 shell (No. 20, coll. Boetger, no date) in vicinities of Ashkhabat (sic).

Additional records. No data.

Ecology. Psammorheophilous, lives at water temperature from 7 to 11 °C, on silt and sand (Izzatulaev et al. 2013).

Remarks. The material on this species, as well as on *Melanopsis ashkhabadensis*, *M. roseni* and *M. zarudnyi*, was initially stored as *M. praemorsa* (identification of Westerlund and Shadin).

77. *Melanopsis zarudnyi* Izzatullaev et Starobogatov, 1984

(Fig. 12A–B)

History of the name application.

Izzatullaev and Starobogatov 1984: 1479–1480, fig. 1 *12,* 3 *6* (description as *M.* (*Canthidomus*), key to identification);

Starobogatov 1994 (mentioned for Kopetdagh zoogeographical province of Turkmenistan);

Starobogatov et al. 2004 (key to identification, general distribution);

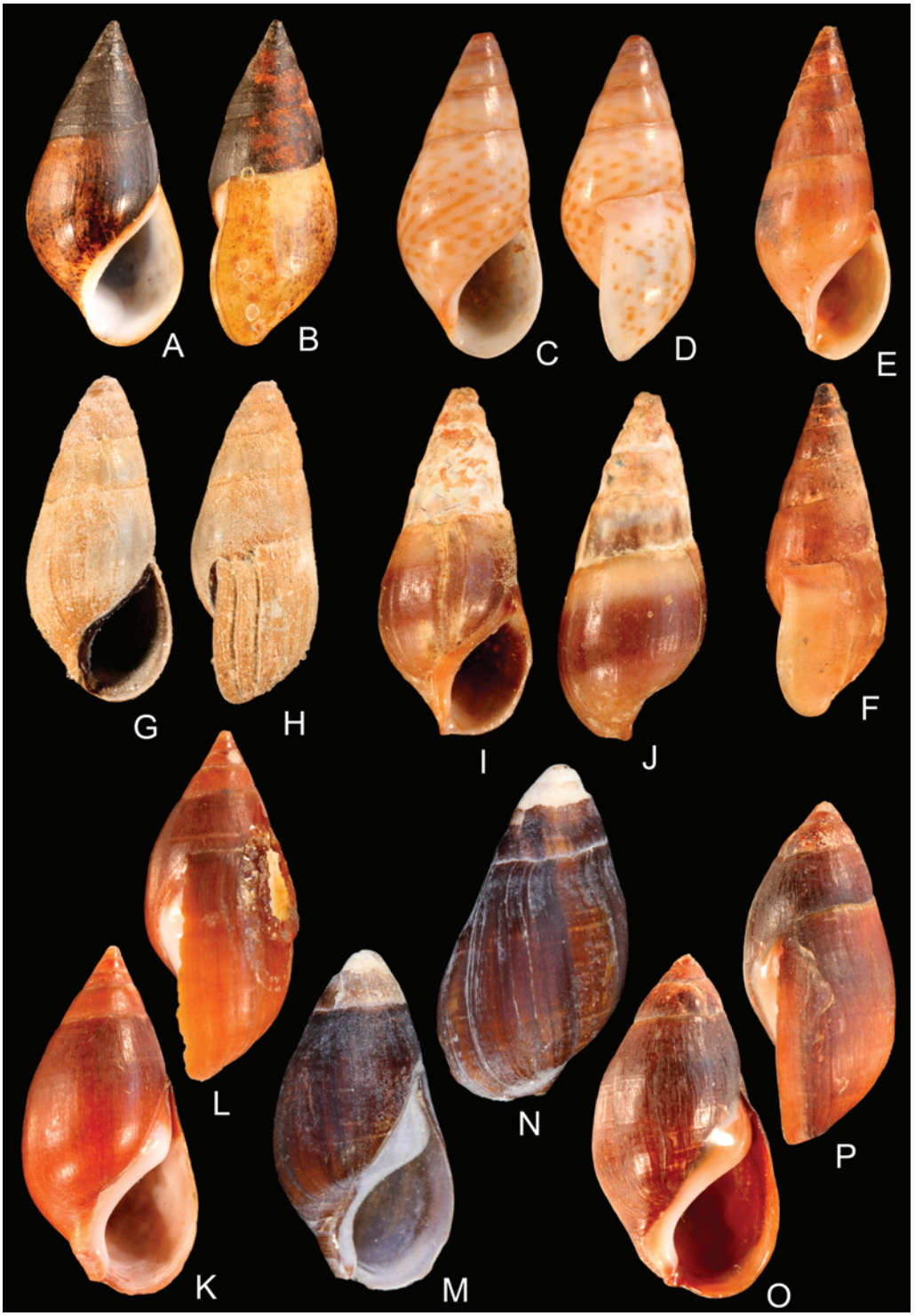

Fig. 11. A–B – *Esperiana dneprensis*, holotype, H = 12.7 mm; C–D – *Esperiana roseni*, holotype, H = 12.6 mm; E–F – *Microcolpia ucrainica*, holotype, H = 13.4 mm; G–H – *Microcolpia schileykoi*, holotype, H = 12.0 mm; I–J – *Microcolpia inconspicua*, holotype, H = 14.7 mm; K–L – *Microcolpia ashkhabadensis*, holotype, H = 16.7 mm; M–N – *Melanopsis roseni*, holotype, H = 22.1 mm; O–P – *Melanopsis starostini*, holotype, H = 21.7 mm.

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Izzatulaev et al. 2013 (ecology);

Vinarski and Kantor 2016 (information about types, type locality and general distribution).

Type locality. "Zolotoi Klyuch" ("Golden spring") near Ashkhabad (former Turkmen SSR).

Types. Holotype (dry): No. 1 (from the same sample as paratypes of *M. turkmenica* No. 6, *M. transcaspica* No. 5, *M. starostini* No. 14, *M. roseni* No. 10 and *M. ashkhabadensis* No. 11). Paratypes (similarly): 9 (dry) paratypes from type locality No. 2; 3 spms in alcohol (No. 3) from Zakaspiysk Province (coll. N. Zarudnyi, 1892); 4 spms in alcohol (No. 4) – Ashkhabad, in mountain rapidly flowings brooks of Firyuza, etc. (S. Korzhinski, 1895); 4 spms in alcohol (No. 5) – Svyatoi Klyuch near Ashkhabad (Bukinich, 1925); 1 shell (No. 6) – Khan-Kyariz (coll. Starostin, 1939) and 1 shell (No. 7) – Ashkhabad (coll. Boetger, without date).

Additional records. No data.

Ecology. Psammorheophilous, lives at water temperature from 7 to 11 °C, on silt and sand (Izzatulaev et al. 2013).

78. *Melanopsis sistanica* Izzatullaev et Starobogatov, 1984
(Fig. 12C–D)

History of the name application.

Izzatullaev and Starobogatov 1984: 1477, fig. 1, *15* (description as type species of subgenus *Sistaniana*, central radular tooth morphology);

Starobogatov and Izzatulaev 1985 (key to identification, cooccurrence with 4 species of the subgenus);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution).

Type locality. "Eastern Persia".

Types. Holotype (in alcohol): No. 1 and 28 paratypes in alcohol (No. 2) from type locality from the same sample (coll. N. Zarudnyi, 1896).

Additional records. Absent in ZIN collection. Brook in area between Birgend and Isfisar and in warm spring at Tuna near Tebbes (Starobogatov and Izzatulaev 1985).

Ecology. No data.

Remarks. Izzatullaev, Starobogatov, 1984 compared this species conchologically with *M. doriae* Issel, 1865 and *M. deserticola* Annandale et Prashad, 1919. The former species was subsequently recorded in several provinces of Iran, but there is no mention of *M. sistanica* and two other listed below species in these areas (Glöer and Pešić 2012).

79. *Melanopsis transcaspia* Izzatullaev et Starobogatov, 1984
(Fig. 12E–F)

History of the name application.

Izzatullaev and Starobogatov 1984: 1478, fig. 1, *9* (description as *M.* (*Canthidomus*), key to identification);

Starobogatov 1994 (mentioned for Kopetdagh Province of Turkmenistan);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantorand Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Izzatulaev et al. 2013 (ecology);

Vinarski and Kantor 2016 (information about types, type locality and general distribution).

Type locality. Gyaure stream, collective farm "Imeni 1 Maya", Ashkhabad Province (former Turkmen SSR).

Types. Holotype (in alcohol): No. 1 and 3 (dry) paratypes (No. 2) from the same sample from type locality (coll. M. Orekhov, 1963); other paratypes: 3 spms (2 dissected) in alcohol (No. 3) from sulphurous source Archman (coll. N. Zarudnyi, 1892); 1 spm in alcohol (No. 4, coll. L. Bianki, 1930) from aryk rapidly flowing from mountains to a river at Kopetdagh foothills; 26 km on the road from Ashkhabad to Firyuza; 29 shells (No. 5, coll. L. Molchanov, 1935) "Zolotoi Klyuch" near Ashkhabad; 14 shells (No. 6, coll. Bukinich, registered in 1926) from alluvial shell limestone in Annau, vicinities of Ashkhabad; 1 shell (No. 7) and 4 shells (No. 8), both coll. P. Varentsov (year of registration – 1926), from Zakaspiysk Province .

Additional records. Turkmenistan, heads of Chulinka River, upstream of settlement; in river of Chevers settlement, heads of Sekizya River (coll. I. Muratov, 1990; det. Ya. Starobogatov).

Ecology. Psammorheophilous, lives at water temperature from 7 to 11 °C, on silt and sand (Izzatulaev et al. 2013)

According to label data, the snails identified as *M. starostini* and *M. transcaspia* were found in the same samples.

Remarks. The species' authors mentioned similarity of the species to *M. mingrelica* A. Mousson, 1863, which is currently considered as a synonym of *M. praemorsa* L., 1758 (Galli 2015).

80. *Melanopsis turkmenica* Izzatullaev et Starobogatov, 1984

(Fig. 12G–H)

History of the name application.

Izzatullaev and Starobogatov, 1984: 1478–1479, fig. 1, *10* (description as *M.* (*Canthidomus*), key to identification);

Starobogatov 1994 (mentioned for Kopetdagh Province of Turkmenistan);

Starobogatov et al. 2004 (key to identification, general distribution);

Kantor, Sysoev, 2005; Kantor et al., 2010 (information about types, type locality and general distribution);

Izzatulaev et al. 2013 (ecology);

Vinarski and Kantor 2016 (information about types, type locality and general distribution).

Type locality. Zakaspiysk Province (former Turkmen SSR).

Types. Holotype (dry): No. 1 (coll. P. Varentsov, 1986, initial identification by Rosen and Westerlund as *M. praerosa mingrelica* Bayer in Mousson, 1863). Paratypes: 22 shells from type locality from the same sample: No. 7; 5 juvenile spms in alcohol (No. 2, coll., M. Orekhov, 1963) from Bagir brook, Ashkhabad Province; 4 spms in alcohol (No. 3, coll. N. Zarudnyi, 1892) from sulphurous source Archman; 10 spms in alcohol (No. 4, coll. S. Korzhinski, 1895) from rapidly running mountain brooks in Ashkhabad vicinities; 4 shells (No. 5, coll. B. Shkaff, 1916) – Germab, in Kopetdagh mountains; 16 shells (No. 6, coll. L. Molchanov, 1935) – "Zolotoi Klyuch" near Ashkhabad; 16 shells (No. 6, coll. L. Molchanov, 1935) – Geok-Tepe (= Gyokdepe), Kopetdagh; 1 shell (No. 8) and 2 shells (No. 9) – Central Kopetdagh, Germab settlement (coll. W. Lindholm, 1935).

Additional records. Turkmenistan, debris of Chulinka River at Markau Mount, 5 km downstream from Chuli settlement (coll. I. Muratov, 1990; det Ya. Starobogatov); heads of Chuli River, upstream of Chuli settlement, and heads of Sekizyab River at Germab settlement (coll. I. Muratov, 1990; det. Ya. Starobogatov).

Ecology. Psammorheophilous, lives at water temperature from 7 to 11 °C, on silt and sand (Izzatulaev et al. 2013).

81. *Melanopsis dragianensis* Starobogatov, Izzatulaev, 1985

(Fig. 12I)

History of the name application.

Starobogatov, Izzatulaev, 1985: 34, fig. 4 (description as *M.* (*Sistaniana*), key to identification);

Bába, 2004: 30 (as *Melanopsis dragiaensis*, mention for Ponto-Caspian refugial areas).

Type locality. Brook between Biryand and Esfizar (Eastern Iran) (coll. A. Goebel, 1858).

Types. Holotype (dry): No.1 and 11 paratypes from type locality and about 200 dry paratypes from warm spring at Tun from Tabas side.

Additional records. No data.

Ecology. The species was found in the type locality together with *M. doriae* Issel, 1865 *M. deserticola* Annandale et Prashad, 1919 and *M. sistanica* Izzatulaev et Starobogatov.

82. *Melanopsis lutensis* Starobogatov et Izzatulaev, 1985

(No photo)

History of the name application.

Starobogatov and Izzatulaev, 1985: 35, fig. 5 (description as *M.* (*Sistaniana*), key to identification);

Bába 2004: 30 (mention for Western Asian elements in Iranian refugial areas).

Type locality. Warm spring at Tun (now Ferdows) from Tabas side (Khorasan Province, Eastern Iran) (coll. A. Goebel, 1858).

Types. Holotype (dry): No.1 and 119 paratypes from type locality (Starobogatov and Izzatulaev, 1985) – not found in the ZIN collection.

Additional records. No data.

Ecology. The species was found in the type locality together with *M. drangianensis*, no other data.

Remarks. Glöer and Pešić (2012) give a photo of the shell of *Melanopsis* sp. (Fig. 12e) from several waterbodies of Eastern Iran, including the Khorasan Province. The illustrated shell shows a similarity with the picture of the holotype of the species under consideration.

THIARIDAE Gill, 1871

MELANOIDES Olivier, 1804

Three species of the genus were recorded in waterbodies of the ex-USSR (Kantor et al. 2010), one of

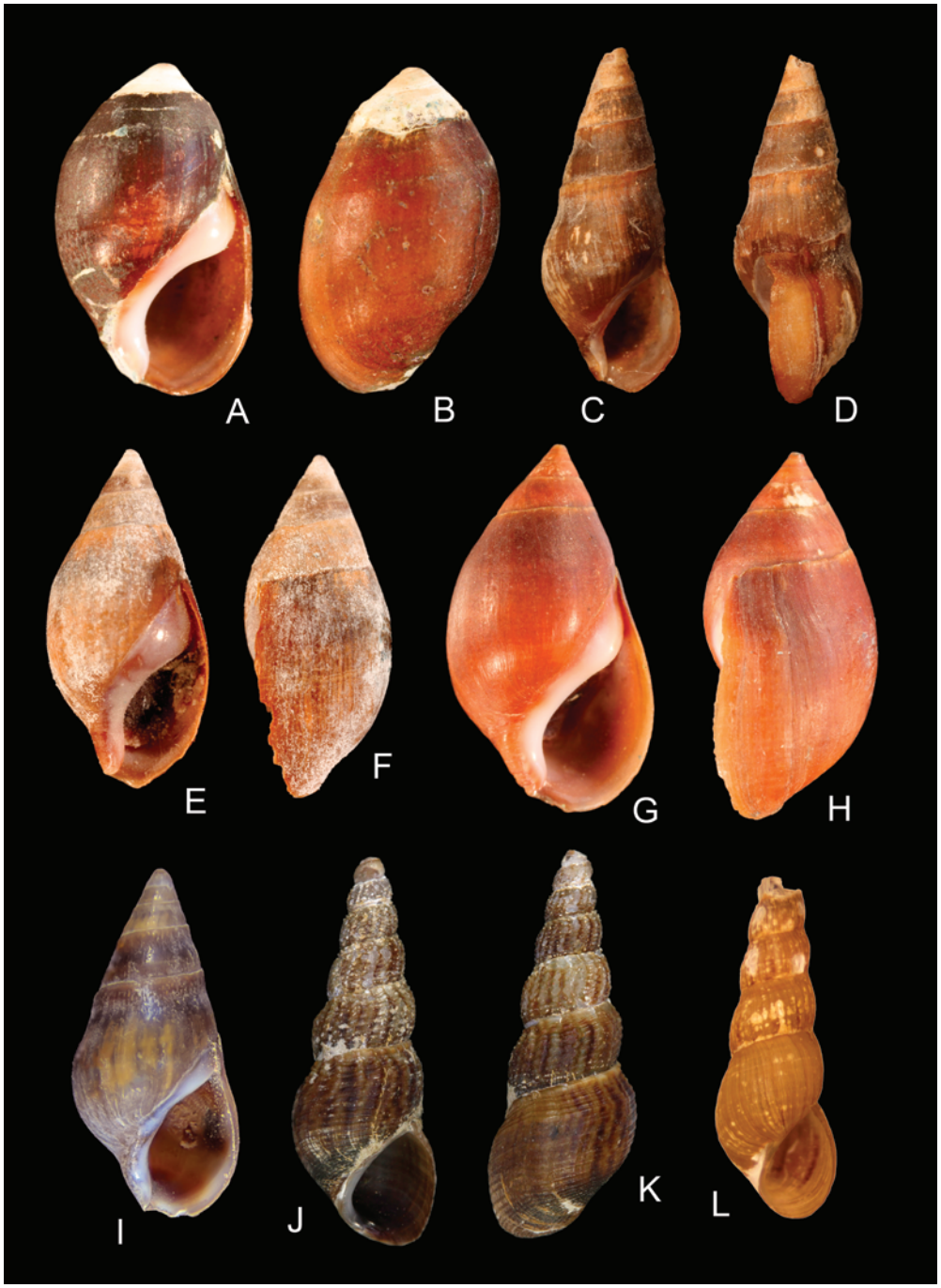

Fig. 12. A–B – *Melanopsis zarudnyi*, holotype, H = 14.9 mm; C–D – *Melanopsis sistanica*, holotype, H = 16.1 mm; E–F – *Melanopsis transcaspia*, holotype, H = 17.4 mm; G–H – *Melanopsis turkmenica*, holotype, H = 18.9 mm; I – *Melanopsis drangianensis*, holotype, H = 14.2 mm; J–K – *Melanoides kainarensis*, holotype, H = 24.8 mm; L – *Melanopsis shahdaraensis,* topotype, H= 11.5 mm.

them was described by Lindholm (1930) as a subspecies of *M. tuberculatus* (Müller, 1774), and two other species – by Starobogatov and Izzatulaev (1980).

83. *Melanoides kainarensis* Starobogatov et Izzatullaev, 1980
(Fig. 12J–K)

History of the name application.

Starobogatov and Izzatullaev 1980: 26–28, fig. 2 *1*, 2, *8* (description, shell measurements, key to identification);

Starobogatov 1994 (mentioned for Eastern Turkmenistan);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution); Kvartalnov et al. 2013 (records from the Chakhdaa River valley, Mountain Badakhshan);

Vinarski and Kantor 2016 (information about types, type locality and general distribution).

Type locality. Warm spring Khodzha-Kainar, Kugitang Ridge, Chardzhou Distinct, former Turkmen SSR.

Types. Holotype (dry): No. 1 and 3 paratypes (dry): No. 2 – from type locality (coll. Starostin, 1941); 13 adult and 40 juvenile paratypes (in alcohol): No. 3 – Sari Pul, Sar-e Pol Province, Afghanistan, in a spring (coll. K. Lindberg, 1957); 3 paratypes (in alcohol): No. 4 – Nishar in the vicinity of Maymana, Faryab Province, in a spring (original text of this label: "Afghanistan, Nishar (between Meymana and Balchirag), a source, Meymenana Province" (coll. K. Lindberg, 1957); 7 adult and 8 juvenile paratypes (in alcohol): No. 5 – Afghanistan, Maymana Province (at present Faryab Province), Darayn-Balchirag, a pond formed by hot springs Chashmayn-Hamman (coll. K. Lindberg, 1957); 16 paratypes (dry): No. 6 – Afghanistan, Herat (from collection of Geological Museum); 8 paratypes (in alcohol): No. 7 – Southeast Turkmenistan, Koytendag Range, Karlyuk's vicinities (coll. P. Strelkov, 1967); 1 paratype (in alcohol): No. 8 – Turkestan SSR, Chershanginsky Province (at present Köýtendag etraby), Hodge-Koynar hot spring (coll. Ljovuschkin, 1963). (The Nos. 9 (shell fragments) and 10 (10 shells) are samples from the same places as No. 8).

Additional records. 63 specimens (in alcohol): No. 11 – Samarqand Province, Sovetoadsky District (at present Nurobod District), kishlak Kurgoncha, near the area of two hot springs Bosch-House (coll., det. Ya. Starobogatov, 1989).

Ecology. Lives in hot springs, brooks, and ponds formed by these springs, down to 2.0–2.5 m depth. The population density reaches 100–150 spms/m^2 (Starobogatov and Izzatullaev 1980).

84. *Melanoides shahdaraensis* Starobogatov et Izzatullaev, 1980
(Figs. 12L)

History of the name application.

Starobogatov and Izzatullaev, 1980: 29–30, fig. 2 *7*, *13* (description);

Kantor and Sysoev 2005; Kantor et al. 2010 (information about types, type locality and general distribution);

Kvartalnov et al. 2013 (records from the Shakhdar River valley, Mountain Badakhshan);

Vinarski and Kantor 2016 (information about types, type locality and general distribution).

Type locality. Hot spring Dzhaushangoz, 3360 m above the sea level, Shakhdar River basin, western Pamir.

Types. Not found in ZIN collection.

Ecology. Lives together with *M. pamiricus* in hot springs, on silty bottom and on stones, at water temperature of 30–32 °C (Starobogatov and Izzatullaev 1980).

Remarks. The ZIN collection contains 6 shells (coll. Churshina) from the type locality of *M. shahdaraensis*. They were identified by Likharev as *M. tuberculatus*. According to P. Kijashko, these shells correspond in appearance to *M. pamiricus* described by Lindholm (1930) from the same area. Palatov (personal communication), having visited the type locality, found snails of both species (*M. shahdaraensis* and *M. pamiricus*) in springs flowing from ruines of Deruzh castle (near Dzhaushangoz settlement). Snails were abundant in springs at water temperature of 25–33 °C, on boulders with fouling (probably consisting of filamentous cyanobacteria, as based on the photo).

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